CHAPTER 2. ALTERNATIVES, INCLUDING THE PREFERRED ALTERNATIVES

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INTRODUCTION

For the purposes of this plan, the Colorado River has been divided into two geographic sections, with a specific set of alternatives for each section:

- **Lees Ferry Alternatives —** Eight alternatives have been developed for the section of river from Lees Ferry (River Mile [RM] 0)* to Diamond Creek (RM 226). The alternatives include a no-action alternative (Alternative A) plus Alternatives B through H.
- **Lower Gorge Alternatives —** Five alternatives have been developed for the section of river from Diamond Creek (RM 226) to Lake Mead (RM 277). The alternatives include a no-action alternative (Alternative 1) plus Alternatives 2 through 5.

Various combinations of alternatives for Lees Ferry and the Lower Gorge are possible, consistent with the different management zones described for each area below. This chapter also discusses the selection of preferred alternatives for both the Lees Ferry and Lower Gorge sections — for the Lees Ferry section the preferred alternative is Alternative H, and for the Lower Gorge section the preferred alternative is Alternative 4. Together these two alternatives can be considered as the National Park Service's preferred alternative for the entire Colorado River corridor in Grand Canyon National Park.

This chapter briefly describes the process and criteria that were used to develop the alternatives, including carrying capacity standards and key trip variables. Elements common to all alternatives are then described, including the operating requirements, the approach for allocating use, additional concessions contract, a monitoring and implementation plan, and management zoning. The alternatives for the Lees Ferry section are then presented, followed by the alternatives for the Lower Gorge. Alternatives considered but eliminated from further study are then listed, followed by the discussion of the environmentally preferred alternative, as required by the National Environmental Policy Act. The chapter ends with a discussion of noncommercial permit system options as elements independent of alternatives, addressing the primary system for the distribution of river permits and transition options.

CRITERIA FOR DEVELOPING ALTERNATIVES

Alternatives were developed for this *Draft Colorado River Management Plan / Environmental Impact Statement* to address the major issues and concerns raised during public and internal scoping meetings in 1997 and 2002 (see Appendix B), and to fulfill the vision, guiding principles, objectives, mandates, laws, and policies described in "Chapter 1. Purpose of and Need for Action." Alternatives were developed during a series of meetings in 2003 and 2004 that involved different combinations of the NPS river management planning team and interdisciplinary team, along with the Hualapai Tribe as a cooperating agency. Representatives of Lake Mead National Recreation Area, Grand Canyon Parashant National Monument, Grand Canyon

* Several river mileage systems are used for the Grand Canyon. River mileages in this document are consistent with the Belknap system, rounded to the nearest whole mile.

National Park, and the Hualapai Tribe also met during this time to discuss management zoning and alternatives related to the Lower Gorge and Whitmore.

The overarching vision for the plan was derived directly from the vision and management objectives in the park's 1995 *General Management Plan.* The Hualapai Tribe's vision statement relates to all areas adjacent to or including Hualapai tribal lands, from approximately RM 165 (National Canyon) to RM 273 (Grand Wash Cliffs), including the Lower Gorge. The reasonable range of alternatives was defined using these vision statements, along with the key parameters discussed below.

ALLOCATION OF USE

Three fundamental ways of distributing trips on the Colorado River in the Grand Canyon are considered in this plan: (1) a "split" allocation system, where commercial and noncommercial users compete for permits in separate pools with different distribution mechanisms, (2) a "common pool" system, where all users compete for permits in the same pool and in the same way, and (3) an "adjustable split" allocation system that combines features of both.

Objectives for Allocating Use

Objectives for allocating use include:

Address user perception of allocation inequity.

Maintain or improve the quality of commercial services offered to river users.

Seek to keep costs to river users as low as possible while adequately funding river operations.

Allocation Options

Option A: No Action / Split Allocation (Current System). Recreational river use in Grand Canyon would continue to be allocated between the commercial and noncommercial sectors in a set ratio that remained the same for the life of the plan.

Option B: Common Pool Allocation. All access for recreational use would be distributed through a single process. People interested in either commercial or noncommercial trips would apply for launches through the NPS permit system. Successful applicants would then choose to (1) organize their own trip; (2) contract with an outfitter to provide a charter trip; or (3) join a non-charter, commercial trip.

Because the exact trip types would not be known in advance of the allocation under a common pool approach, an initial analysis indicates that no more than four launches per day could be allowed from May through August, and two launches per day in March and April and in September and October. This level of use would still ensure a high probability that resource and social carrying capacity guidelines would continue to be met even if every group that received a permit took the maximum number of people for the maximum length trip. Because some launches would likely take smaller groups or make shorter trips, additional launches might be added after the mix of trips was known and overall impact levels could be accurately predicted.

Option C: Adjustable Split Allocation. Allocations would be initially set for each sector, as in the split allocation system. Then, as new data were obtained, future adjustments would make allocations more reflective of measured demand.

A single registration system would be implemented to enable the National Park Service to record interest in various types of trips and services. Hopeful recreational users, both commercial and noncommercial, would first register through this system. Those seeking commercial trips would then be instructed to contact the commercial company of choice directly, and those seeking to participate in noncommercial trips would be seamlessly passed through to the noncommercial permit system.

Information obtained through this system would be used by the Park Service to make demand-responsive transfers between commercial and noncommercial sector allocations. To mitigate the impact of these adjustments, the following safeguards would be imposed:

(a) The maximum potential transfer between commercial and noncommercial sectors would be two launches per calendar month.

(b) A sector's allocation would only be eligible for a demand-responsive transfer if its allocation during that calendar month was greater than 40% of total launches (i.e., a sector's allocation could not be reduced below 40% of the combined commercial plus noncommercial launches).

(c) Demand-responsive adjustments would go into effect two years after the system dictated that an adjustment was warranted. In other words, if demand was measured to be unequal in 2006, then the 2008 allocation would be adjusted.

This incremental adjustment in allocation, combined with overall safeguards to long-term trip allocation, would provide a level of security to both sectors, while providing responsiveness to changes in demand. The allocation uncertainty resulting from these adjustments would not be prohibitive to commercial entities serving either sector. Demand fluctuations within the national recreation industry are typically far greater than they would be under this system.

Commercial contracts would be written to ensure that companies retained a reasonable opportunity to realize a profit without unreasonable risk regarding future sales (e.g., graduated franchise fee schedules, etc.). Appropriate limits on trip lengths and group sizes would be established for "switched trips" to ensure that resource and social carrying capacity guidelines would continue to be met.

NPS Preferred Allocation Option

Option C (an adjustable split allocation) is the NPS preferred option. Adjustable split allocations offer the advantage of being able to adapt and respond to important factors such as demand while maintaining a degree of planning stability for commercial companies. An "all-user registration" process could be implemented to enable the National Park Service to obtain up-to-date demand information from users.

Profitability for concessions operations is not discussed here because it is implicit that in the implementation of any system the Park Service is required to ensure that concessions operations retain a reasonable opportunity to make a profit.

How well each option would meet objectives is summarized in Table 2-1.

TABLE 2-1: HOW ALLOCATION OPTIONS MEET OBJECTIVES

Does Option Meet Objective?	Split Allocation	Common Pool	Adjustable Split
Help address user perception of allocation inequity.	No	Yes	Yes
Maintain or improve quality of commercial services offered to river users.	Yes	No	Yes
Seek to keep costs to river users as low as possible while adequately funding river operation.	Yes	No	Yes

CARRYING CAPACITY AND KEY CRITERIA FOR DEVELOPING LEES FERRY ALTERNATIVES

The planning process for the *Colorado River Management Plan* has generated several new ways to analyze visitor carrying capacity, visitor experience, and potential "visitor use impacts" on the resource. As applied to national parks, visitor carrying capacity is defined as "the type and level of visitor use that can be accommodated while sustaining acceptable resource and social conditions that complement the park" (NPS 1997). The concept of carrying capacity is intended to safeguard the quality of park resources and the visitor experience. Park resources in this context encompass all of the biophysical, aesthetic, and cultural elements and features contained in a park. Visitor use impacts are primarily attributable to visitor behavior, use levels, types of use, and location of use.

The primary factors that determine carrying capacity on the Colorado River are

- number, size, distribution, and expected lifespan of camping beaches
- number, types, and condition of natural and cultural resources
- contacts per day (on-river attraction site encounters), campsite competition, number of trips at one time (TAOT), number of people at one time (PAOT), group size, trip length, and launch patterns

The first two factors describe the physical environment and serve as the foundation for determining appropriate levels of overall use. The third factor describes variables that characterize the visitor experience. Park personnel are familiar with the character of the camping beaches, and they have data on the types of resources that are located at attraction, camping, and launch sites and on how visitors impact those resources. By using various tools, park staff members have been able to analyze visitor experience indicators and to determine how the limited campsites available on the river accommodate various group sizes, trip lengths, and launch scenarios, along with the related effects on visitor experience and resource vulnerability.

Several other information sources have been extremely valuable in determining carrying capacity include the Grand Canyon River Trip Simulator (GCRTS), public comments, data from the online launch calendar, River Office statistics, visitor use research, and camping beach research. These analysis tools have been used to create new launch schedules and alter existing ones, to analyze current trends and use patterns, and to predict the number of trips, people, group sizes, and user days that the Colorado River and its camping beaches and attraction sites can accommodate at any given time.

The Grand Canyon River Trip Simulator is an integrated statistical computer simulation that models complex and dynamic human / environment interactions along the Colorado River in the park. Data on river trip behavior was collected in the form of trip reports from commercial and noncommercial boaters during the 1998–2000 summer seasons. From these data, river trip speed, the probability of a trip stopping at a site, the average time spent at sites, crowding at attraction and launch sites, and many other important factors were calculated. The trip simulator has many output and analysis options, including graphs, tables, charts, and visualizations.

In addition, maps that show all known cultural and natural resource areas of concern, as well as recreational stopping points (with site impact ratings) and their level of use based on the river trip simulator, have been developed for NPS use. When different launch schedules are run in the trip simulator, changes in the intensity of use can be predicted at each of the river stops and then compared to biophysical impact data (from various Grand Canyon monitoring projects) and the resource map. In this way areas of resource vulnerability from visitor impacts can be identified based on various launch schedules.

Years of research conducted in the canyon have given park managers baseline data on cultural and natural resources and visitor use, as well as impacts from visitors, nonnative species, and Glen Canyon Dam. These kinds of data have provided an in-depth understanding of the current river corridor environment and how it may be affected in the future. The data have shown the effectiveness and cost of restorative efforts, how visitors impact the environment, and what visitor expectations are for a river trip.

Carrying Capacity Standards

To develop carrying capacity standards for the Lees Ferry alternatives, spreadsheets were created to calculate the probable number of trips at one time, people at one time, and user discretionary time for any launch schedule (including trip type, size, and length). These spreadsheets allowed the planning team to test a wide range of possibilities and to eventually settle on the range of alternatives described in this chapter.

The planning team concluded that no single standard could be used to calculate carrying capacity for recreational use in the river corridor. Rather, it is necessary to consider the interaction of user-days, the number of trips and people in the canyon at one time, and the amount of user discretionary time, and how they affect resources and visitor experiences. The following discussion summarizes how each of these key standards was used to determine carrying capacity.

- *Trips at One Time (TAOT)* — The number of trips at one time is the maximum total number of trips in the canyon at one time under each alternative. This helps to determine

the anticipated number of contacts per day, the number of campsites occupied, and crowding at attraction, launch, and takeout sites. These factors and how they influence the level of anticipated impacts to resources and visitor experience are crucial elements of the impact analysis. The number and size of these beaches are diminishing. Because beaches are not evenly distributed, bottlenecks occur in some places. Camping at the same site or at nearby sites within sight or sound of another group becomes necessary in some places when there are 70 trips at one time, about the maximum current level. An important decision regarding carrying capacity was to reduce trips at one time from the maximum current level and to provide seasonal variations in the number of trips at one time. The action alternatives reduce peak trip levels from 70 at one time (the current situation) to between 53 and 60.

- *People at One Time (PAOT)* — The number of people in the river corridor on any given day is an alternative measure that provides information similar to trips at one time. The number of people at one time is more useful as a measure of crowding. This variable applies to total recreational users (i.e., all people except commercial guides). The action alternatives reduce the maximum total number of people (passengers and crew) from the current maximum of 1,095 to between 877 and 982.
- *User Discretionary Time (UDT)* — User discretionary time is an indicator of the cumulative amount of time that people have to experience and explore the river corridor during their river trip. The type of trip, its length, and the time of year (seasonal availability of daylight) all affect the amount of time that recreationists have available to interact with the environment. Because several assumptions about human behavior on river trips were used to develop the quotient, user discretionary time is a relative indicator rather than a definitive carrying capacity standard.

Key Trip Variables

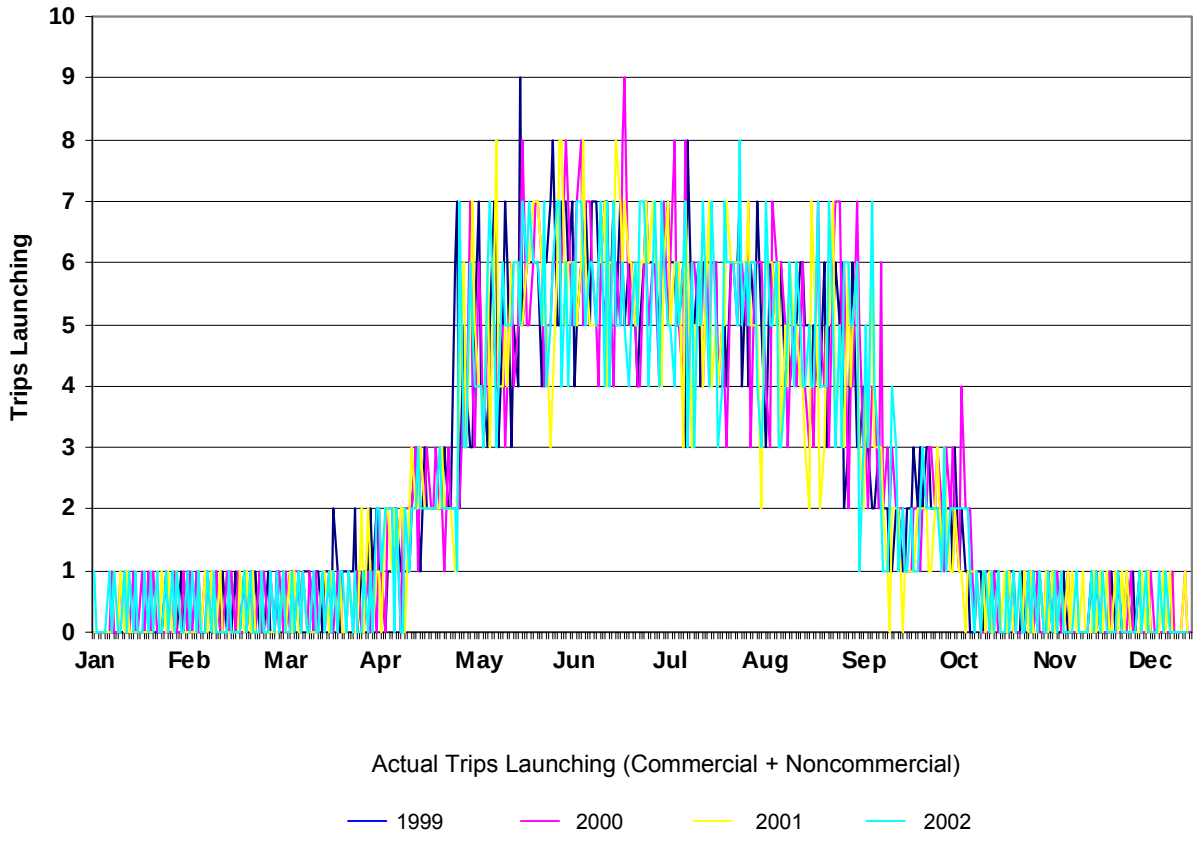
To provide a diverse range of quality visitor experiences while protecting resources and providing access that is appropriate and consistent with each management zone (as discussed beginning on page 32), management prescriptions were developed utilizing key trip variables. These variables — launches per day, group size, trip length, seasonality, and user-day limits — are responsive to changing resource conditions. For example, research indicates that campsites are diminishing in size and distribution and that, in order to ensure long-term protection of sensitive resources in the old high-water zone, it may be necessary to reduce group size and the number of launches per day. The following discussion summarizes how each key trip variable could be managed to achieve management objectives:

- *Launches per Day* — The number of launches per day at Lees Ferry varies widely under current conditions (see Figure 2-1). It was decided early in the planning process to move to a launch-based system and to distribute launches more evenly. The number of launches per day for each trip is one of the most important factors in assessing and addressing issues of encounters with other groups, congestion at attraction sites, competition for campsites (especially at bottlenecks), congestion at launch and takeout sites, and other visitor experience and resource issues (see Chapters 3 and 4 for additional discussion). This important variable can be directly prescribed by NPS managers to achieve management objectives. The action alternatives reduce the maximum number of trips launching

per day from 9 (under the no-action alternative) to between 4 and 6 during the summer peak season. (Graphs showing average and maximum launches per day by trip type and month are important parts of the descriptions of Alternatives A–H. The trip types are shown in the following order from bottom to top: commercial motorized trips, commercial non-motorized trips, noncommercial standard size trips [up to 16 people], and noncommercial small size trips [up to 8 people]. Mixed-use months allow launches of both motorized and non-motorized trip types; no-motor months have no commercial motorized launches. In some cases, half launches are shown; this means that one group of the trip type is allowed to launch every other day.)

- *Group Size* — The size of one's group is an important consideration in the field of recreational use management, as explained more completely in Chapters 3 and 4. Group size affects one's own group, as well as other groups encountered. It also affects park resources because larger groups need more space for activities. When large groups camp at ever diminishing beaches, they are forced to spread out into the old high-water zone. This intrusion puts sensitive resources at risk. Smaller groups have flexibility to use small or large sites. Larger groups are more likely to disturb larger areas (Hendee, Stankey, and Lucas 1990). Group size is another important variable that can be directly prescribed by the National Park Service to achieve management objectives. A new small noncommercial group size of no more than 8 people is considered in several alternatives. The action alternatives reduce the maximum group size from 43 (passengers and crew) to 24–40.

FIGURE 2-1: ACTUAL TRIPS LAUNCHING PER DAY (1999 – 2002)



- *Trip Length* — In each alternative maximum trip lengths are assigned to the various trip types. Trip length is defined as the number of different days the trip is on the river between Lees Ferry and Diamond Creek (i.e., the number of nights plus one).The minimum and maximum number of days that a trip may be in the canyon is correlated with such factors as how many miles need to be traveled each day for different trip types, how many campsites are available for use, and how much time is available for hiking and visiting attraction sties. The speed of the river, mostly influenced by flow volume, also affects these factors. Motor trips move more quickly, thus have shorter allowable trip lengths. Trip lengths help determine the amount of time that visitors can experience and interact with the canyon environment. While longer trips allow for more of this interaction, they also contribute to an increase in trips at one time, people at one time, and the vulnerability of cultural and natural resources. Trip length is a key factor that can be directly prescribed by the National Park Service to achieve management objectives, and it is a key variable in the river trip simulation modeling.
- *Seasonality* — Seasonality was a key factor in developing and analyzing alternatives. March and April (the spring shoulder season), May through August (summer), September and October (the fall shoulder season), and November through February (winter) are the time periods considered. Varying use by season offers a broader spectrum of visitor experiences and opportunities. Almost all current river use occurs from March through October rather than year-round. In the development of alternatives, the same time period was compared to the other new action alternatives. A set of winter test launches indicates there is interest in trips during the winter. Historically, winter use has been low. However, winter trips offer opportunities for quiet and solitude unavailable during other times of the year. Weather conditions are not too harsh, and winter moisture nourishes desert vegetation. The uncrowded nature of the winter months enhances wildlife viewing, and cooler daytime temperatures are conducive to off-river hiking.
- *User-Day Limits* — Each day or portion of a day that a visitor (user) is in the canyon is considered a user-day. User-days can be affected by factors that are directly prescribed (i.e., launches, trip length, and group sizes); therefore, it can be managed to achieve management objectives. Except in one alternative where use is expected to be lower, commercial user-days are capped between March and October at current levels. Noncommercial use is restricted through launches, not user-day caps. In response to public comment, the intent is to allow more noncommercial use while keeping impacts and the other parameters within reasonable levels.

ELEMENTS COMMON TO ALL ALTERNATIVES

OPERATING REQUIREMENTS AND NEW ACTIONS FOR ALL ALTERNATIVES

In developing alternatives it was assumed that the current operating requirements for commercial and noncommercial users would continue largely unchanged for the near term. The operating requirements include key safety, environmental, and health-related standards; they are not part of this plan, rather they are administrative details that may change as techniques, practices, or data gathering improve or become available. (Current “Commercial Operating Requirements” for

Grand Canyon National Park are available upon request from park headquarters.) Procedures to change the operating requirements will not change. The only changes to the operating requirements that are being considered in this plan are to add the following:

- *Repeat Use* — To maximize opportunities of the public to access and experience Grand Canyon river trips, repeat use in the Lees Ferry to Diamond Creek section is limited to one river trip per year for all recreational users, whether going commercially or noncommercially.
- *Generator Use* — Generator use will be limited to emergency situations and pumping rafts. Generators may not be used in the river corridor for other purposes, including providing power for lights, appliances, or sound equipment. Administrative trips will be allowed to use generators when necessary to complete work projects, consistent with minimum tool requirements.
- *Commercial Operator Responsibility for Passengers* — Commercial passengers must be accompanied by an NPS approved guide on all trip-related hiking, including hiking exchanges both into and out of the canyon.
- *Guides* — The number of commercial guides and crew will not count against user-day allocations, but they will be included when reporting actual river use statistics. The intent is to encourage commercial concessioners to provide adequate numbers of guides rather than to maximize limited user-day allocations. It will also ensure that allocation comparisons with previous plans are consistent. Guides and other commercial crew will be counted within group size limits; guides are indistinguishable from other users regarding social and ecological impacts.
- *Site Restrictions* — Tapeats and Kanab Creeks: Use at the mouth of Tapeats and Kanab creeks will be restricted to day-use only. River trips must camp well above or below the mouth of Tapeats and Kanab creeks to protect natural and cultural resources. This site restriction is based on extensive monitoring data and the lack of beach area suitable for camping. Past impacts to the site have included soil compaction, accumulation of human waste, vegetation damage, and multiple trailing.

  Little Colorado River: No boats will be allowed to enter or park in the Little Colorado River. To stop in the vicinity of the Little Colorado River, boats may, however, park upstream or downstream of the river's mouth. Swimming and wading in the Little Colorado River will be limited to the lowermost 300 feet from March 1 through August 31. Camping and fishing bans will remain in place. The purpose of these restrictions is to protect spawning and young-of-the-year humpback chub, an endangered species.
- *Diamond Creek Takeout Procedures / Scheduling* — Commercial takeouts, noncommercial takeouts and launches, and Hualapai River Runner (HRR) launches occur at Diamond Creek. The beach and the primitive Diamond Creek road have not always accommodated these various uses at peak periods. Because HRR trips launching at Diamond Creek must coordinate with helicopter takeouts farther downstream, the Hualapai Tribe has requested that non-Hualapai river runners do not use the Diamond Creek ramp area between 7 A.M. and 9 A.M.
- *Minimum Trip Length to Phantom Ranch* — The minimum trip length from Lees Ferry to Phantom Ranch will be three nights and part of four days in order to provide a higher

quality experience and to spread out use. This is requirement adds one night to the current requirement.

- *Commercial Guides on Noncommercial Trips* — Commercial guides may not be hired to assist on noncommercial trips. This clarifies an existing requirement.

ADMINISTRATIVE USE

Administrative use is considered as an addition to the recreational use allocation described in the alternatives. Administrative use includes resource management, educational, research, visitor protection, tribal, and service trips. These trips will be scheduled to minimize impacts to recreational users, such as campsite competition and launch congestion.

Non-park research trips are subject to a specific research permitting and river trip application process. NPS resource management, educational, tribal, and service trips are subject to a river trip application and review process prescribed by park standard operating procedures developed in 2004.

All other administrative trips will be subject to an approval process that includes, but is not limited to, the following criteria:

(1) affiliation with an existing educational or service-oriented organization

(2) assistance with NPS-approved research or conservation projects

(3) agreement to complete a report about the trip objectives and accomplishments

(4) meeting the minimum-tool mandate for a potential wilderness area

Non-research administrative trips may be self-outfitted or employ commercial guides and/or outfitters since such trips do not count against outfitter allocations. These trips must be scheduled one year in advance.

MONITORING AND IMPLEMENTATION PLAN

Subject to the availability of necessary funding, the National Park Service will develop a monitoring and implementation plan after completion of the *Colorado River Management Plan* revision process. As part of this, the limits of acceptable change indicators and standards from the 1989 river management plan will be revised as appropriate. Also, if resource conditions change sufficiently to adversely affect recreational experiences (e.g., disappearing beaches), or if mitigation measures cannot be adequately implemented or are unsuccessful, then park managers may use an adaptive management approach to review and revise visitor use prescriptions in this river management plan.

MANAGEMENT ZONING

NPS *Management Policies* require that management zoning be used to prescribe management strategies that will fulfill management objectives and achieve the purpose of the park. In accordance with the 1995 *General Management Plan,* the Colorado River corridor is within the park's

natural zone, which is "managed to conserve natural resources and ecological processes and to provide for their use and enjoyment by the public in ways that do not adversely affect these resources and processes." The *General Management Plan* describes specific objectives for managing for a diverse range of visitor experiences compatible with the protection of resources and values.

To represent the diversity of recreational settings and opportunities, the *Colorado River Management Plan* will adopt management zones based on the recreational opportunity spectrum (ROS) framework. This is a planning framework that recognizes that recreationists participate in various activities in different biophysical / social / managerial settings in order to realize various experiences (Hammitt and Cole 1987).

In cooperation with the Hualapai Tribe and Lake Mead National Recreation Area, additional management zones were defined to reflect the variety and intensity of visitor use and activities from Lees Ferry to Lake Mead, including the 108-mile Area of Cooperation defined in the "Memorandum of Understanding" between the Hualapai Tribe, Lake Mead National Recreation Area, and Grand Canyon National Park, which extends from National Canyon to Lake Mead. The river management plan also maintains a temporal recreation opportunity spectrum, which recognizes that visitor experiences and opportunities may vary by season.

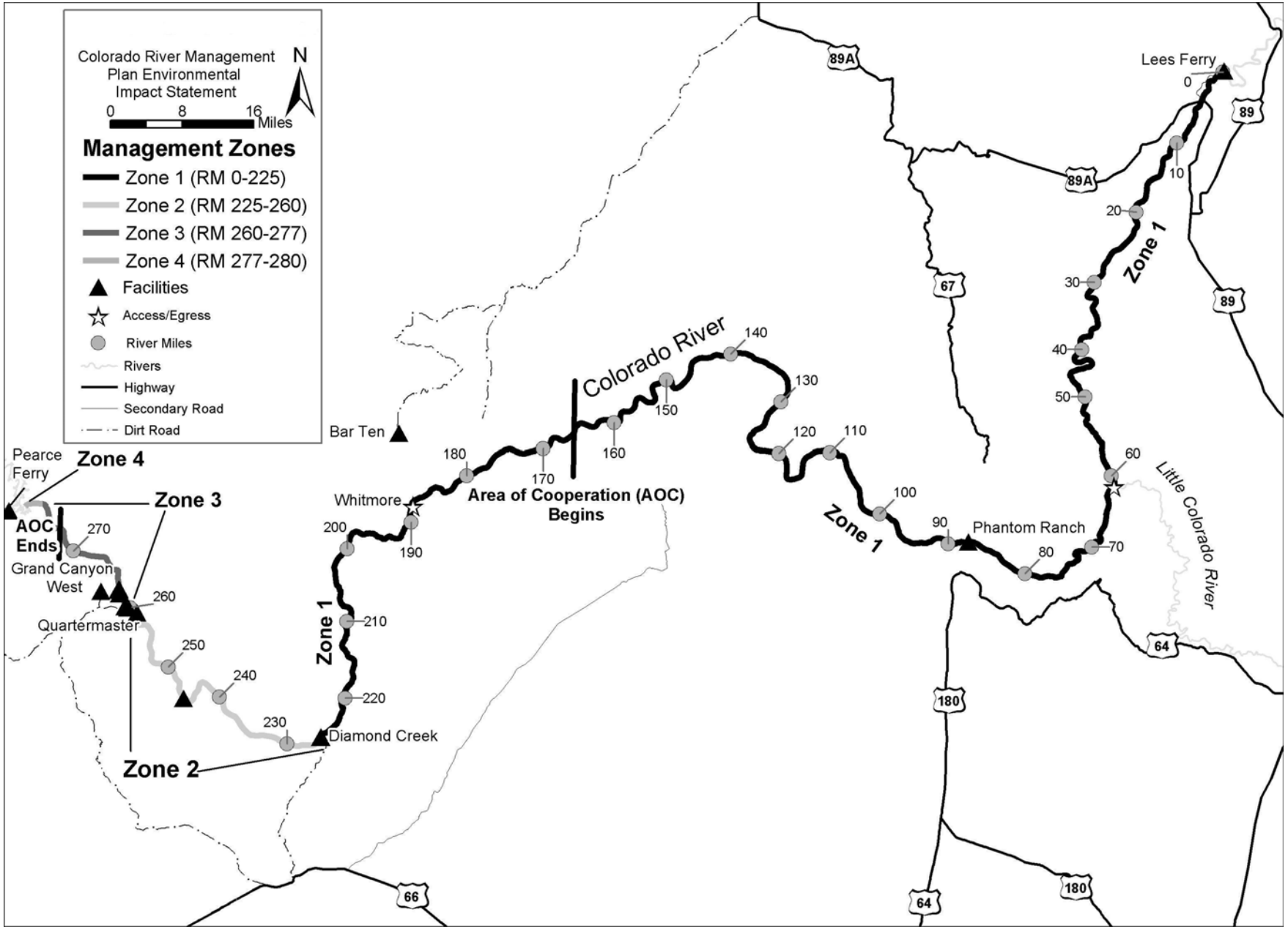
Zone 1: Lees Ferry to Diamond Creek (RM 0 to RM 226)

Consistent with the goals and objectives in the *General Management Plan,* this zone is characterized as a primitive setting within recommended wilderness, which provides a variety of personal experiences from solitary to social. The Area of Cooperation and Hualapai tribal lands begin in this zone near RM 165 (National Canyon) and extends for approximately 60 river miles to Diamond Creek, and then into Zones 2 and 3. Whitewater-rafting trips are the primary activity, with opportunities for hiking. Moderate to high levels of use occur from May through August. Opportunities for solitude increase during the shoulder and winter months.

Zone 1 is a natural environment with low to moderate impacts from recreational use, although impacts may be higher at some popular camps, attraction sites, and access areas. Trips originate at Lees Ferry, but trips can also be accessed at Phantom Ranch and Whitmore. Camping is concentrated on beaches, within the post-dam high-water zone and riparian areas. Management activities include resource monitoring, research, and NPS patrols. Site rehabilitation, restoration, or maintenance is conducted to mitigate impacts to natural and cultural resources. With the exception of Phantom Ranch, there are no facilities in this zone.

Zone 2: Diamond Creek to Quartermaster Canyon (RM 226 to RM 260) — Lower Gorge

This zone coincides with a portion of the Area of Cooperation with the Hualapai Tribe and Lake Mead National Recreation Area, and it is characterized as semi-primitive — a transition from a primitive, wilderness-like setting to a social setting resulting from increased use and variety of activity. The Diamond Creek road provides motorized access to the river, thus providing the opportunity for new levels and types of use, such as day and short overnight trips offered by the Hualapai Tribe. River trips from Lees Ferry may takeout at Diamond Creek or continue down


Colorado River Management Plan Environmental Impact Statement
N
0 8 16 Miles
Management Zones
Zone 1 (RM 0-225)
Zone 2 (RM 225-260)
Zone 3 (RM 260-277)
Zone 4 (RM 277-280)
Facilities
Access/Egress
River Miles
Rivers
Highway
Secondary Road
Dirt Road
Lees Ferry
Bar Ten
Pearce Ferry
Whitmore
Phantom Ranch
Grand Canyon West
Quartermaster
Diamond Creek
Colorado River
Little Colorado River
Area of Cooperation (AOC) Begins
AOC Ends
Zone 1
Zone 2
Zone 3
Zone 4
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
89A
89
67
64
66
180

river. Use occurs at varying levels year-round, with moderate to high levels of use occurring from March to October. Opportunities for solitude increase during the remainder of the year.

Zone 2 is a natural to modified natural environment due to the influence of Lake Mead, which begins near Separation Canyon (RM 240). Due in part to sediment depletion from Glen Canyon Dam, camping beaches are limited in the first 18 miles. Camping areas below Separation Canyon are limited due to lake effects, such as vegetation growth. Both the National Park Service and the Hualapai Tribe periodically monitor and conduct research in this zone. In addition to Diamond Creek road, the Hualapai Tribe maintains "rustic" shade structures with picnic tables and composting or portable toilets at Diamond Creek. A composting toilet is also located at Spencer Canyon.

Zone 3: Quartermaster Canyon to the Park Boundary (RM 260 to RM 277) — Lower Gorge

This zone, located within the Area of Cooperation with the Hualapai Tribe, is characterized as a rural natural setting due to a substantial shift from a semi-primitive experience to more of an urban-oriented experience. In addition to the river trips originating from Lees Ferry and Diamond Creek, other recreational activities include noncommercial trips and commercial takeout shuttles originating from Lake Mead, and Hualapai-run helicopter landings and pontoon tours in the vicinity of Quartermaster (RM 259 to RM 263). High levels of use occur from March to October, and moderate to low use occurs during winter months.

Zone 3 is a modified natural environment due to the influence of Lake Mead. Camping is limited to silt banks and open areas. Rustic recreational facilities and boat mooring may be provided, contingent on environmental compliance, in the vicinity of Quartermaster for the safety and convenience of users, as well as for resource protection. Facilities are also located at lake takeout points (e.g., Pearce Ferry, which is currently inaccessible from the river, and South Cove).

Zone 4: Park Boundary to Lake Mead — Lower Gorge

This zone is characterized as a transition from a rural natural to an urban setting. There may be an increasing level of recreational activities, including powerboating, fishing, and sight-seeing trips originating primarily from Pearce Ferry (currently inaccessible from the river) and South Cove in upper Lake Mead. High use levels occur from March to October, and moderate to low use occurs during winter months.

Zone 4 is a modified natural environment. River- and lake-based camping are limited to silt banks and open areas. Facilities at Pearce Ferry (currently inaccessible from the river) and South Cove include launch ramps, parking, and toilets; camping is allowed at Pearce Ferry.

LEES FERRY ALTERNATIVES (RM 0 TO RM 226)

Key variables and indicators of use for each of the alternatives for the section of river from Lees Ferry to Diamond Creek are summarized below in Table 2-2, followed by descriptions of each of the alternatives.

TABLE 2-2: SUMMARY OF ALTERNATIVES: LEES FERRY TO DIAMOND CREEK

	Alternatives							
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Number of Motor / No-Motor Months	9/3	0/12	0/12	8/4	6/6	6/6	8/4	6/6
Months with No Motors	Sept 15–Dec 15	All	All	Mar, Apr, Sept, Oct	Oct–Mar	Jul–Dec	Sept–Dec	Sept–Feb
Maximum Number of Launches per Day								
Summer	9	4	4	5	6	6	6	6
Shoulder	7	2	3	3	3	4	5	3
Winter	1	1	2	1	2	2	2	1
Maximum Group Size (including guides)								
Commercial Motor	43	N/A	N/A	23	30	30	40	32/24
Commercial Oar	39	25	30	25	25	30	30	32/24
Noncommercial Standard	16	16	16	16	16	16	16	16
Noncommercial Small	N/A	8	N/A	8	8	8	8	8
Maximum Trip Length to Diamond Creek (in number of days)								
Summer (May–August)								
Commercial Motor	18	N/A	N/A	10	8	10	8	10
Commercial Oar	18	16	16	16	14	16	14	16
Noncommercial	18	16	16	16	16	16	14	16
Shoulder Seasons (March–April / September–October)								
Commercial Motor	18	N/A	N/A	10	8	10	8	10
Commercial Oar	21	18	18	18	16	18	16	18
Noncommercial	21	18	18	18	18	18	16	18
Winter (November–February)								
Commercial Motor	30	N/A	N/A	18	N/A	18	N/A	N/A
Commercial Oar	30	N/A	21	21	N/A	21	N/A	21
Noncommercial Motor	30	N/A	N/A	18	N/A	18	18	N/A
Noncommercial Oar	30	18	21	30	21	21	21	25
Whitmore Exchanges								
Helicopter (months allowed)	All	None	None	None	Apr–Sept	Jan–Jun	Jan–Aug	May–Aug
Hiking (months allowed)	All	None	All	All	All	All	All	Mar., Apr., Sept., Oct.
Maximum Number of Trips at One Time	70	60	60	58	60	54	53	60
Maximum Number of Passengers at One Time	1,095	877	900	890	972	972	8,985	982
Probable Total User-Days								
Commercial	113,083	97,694	166,814	137,368	115,500	128,689	115,500	115,500
Noncommercial	58,048	74,523	115,783	85,946	121,683	106,457	134,410	102,725
Total	**171,131**	**172,218**	**282,598**	**223,314**	**237,183**	**235,146**	**249,910**	**218,225**
Probable Total Yearly Passengers								
Commercial	18,891	7,914	17,686	14,979	16,120	18,671	19,688	19,835
Noncommercial	3,571	4,980	7,543	5,449	7,693	6,745	8,992	6,482
Total	**22,461**	**12,894**	**25,228**	**20,427**	**23,812**	**25,415**	**28,680**	**26,317**
Opportunity for Winter Commercial Trips?	Motor or oar	No	Oar	Motor or oar	No	Motor or oar	No	Oar
User Discretionary Time (total yearly hours)	355,081	576,754	752,496	710,079	569,603	518,889	421,073	554,103

ALTERNATIVE A: NO ACTION (CURRENT CONDITIONS)

Alternative A is the no-action alternative for the Colorado River section between Lees Ferry and Diamond Creek. Under current conditions the number of launches per day at Lees Ferry varies widely, and during spikes in peak season, up to nine trips per day can launch. This alternative would continue to allow mixed use (both motorized and non-motorized trip types) for nine months and non-motorized use for three months. There are no limits on helicopter exchanges at Whitmore. The total number of commercial and noncommercial passengers averages 22,461.

WHAT THIS ALTERNATIVE ACCOMPLISHES

Carrying Capacity Standards

- The maximum number of trips at one time would remain at 70.
- The maximum number of people at one time would remain at 1,095.
- Total user discretionary time in hours per year would remain at 355,081.

March to October Overall Use

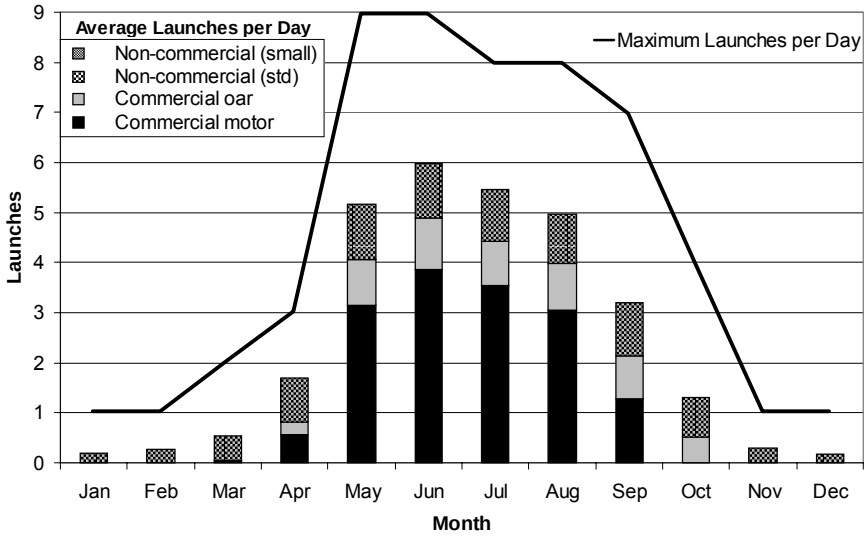
- The number of probable recreational passengers would remain at the current level of 22,143.
- The number of probable trips launching would remain at the current level of 866.
- The number of probable user-days would remain capped at the current level of 164,972.

KEY TRIP VARIABLES

Launches per Day

- Daily launches would continue to fluctuate widely, with as few as three and as many as nine during the peak summer season. Figure 2-2 refines the data presented in Figure 2-1 and shows the average launches per day per trip type, as well as the maximum launches per day, based on data from 1998 through 2003. (Similar charts for all the Lees Ferry alternatives allow the alternatives to be readily compared.)

FIGURE 2-2. AVERAGE AND MAXIMUM LAUNCHES PER DAY BY TRIP TYPE — ALTERNATIVE A



Maximum Group Sizes (includes guides)

- Commercial motor trip sizes would remain at 43 people, the highest of all alternatives.
- Commercial non-motorized trip sizes would remain at 39 people, the highest of all alternatives.
- Noncommercial trip sizes would remain at 16 people.

Maximum Trip Lengths (in number of days)

- The maximum number of days for commercial motorized trips would remain at 18 days in the summer and shoulder seasons and 30 days in the winter.
- The maximum number of days for commercial non-motorized trips would remain at 18 days in summer, 21 days in the shoulder seasons, and 30 days in winter.
- The maximum number of days for noncommercial oar and motor trips would remain at 18 days in summer, 21 days in the shoulder seasons, and 30 days in winter.

March-to-October User-Day Limits

- Commercial use would be capped at 115,500 user-days.
- Noncommercial use would be capped at 54,450 user-days.

Winter Use

- Winter use would remain at its current low level of 318 total probable passengers (the lowest winter use of all alternatives).

OTHER ISSUES

Mixed Use / Non-motorized Seasonal Use

- The mixed-use season (both motorized and non-motorized use) would continue to run from December 16 through September 15 (nine months)
- The non-motorized season would continue to be from September 16 through December 15 (three months)

Whitmore Helicopter Exchanges

- There would continue to be no limits on helicopter use for passenger exchanges at Whitmore. Currently, approximately 6,800 passengers end, and 3,500 passengers begin, their trips by helicopter at Whitmore. In this alternative helicopters would be prohibited except for approved research or park administrative purposes at any other location (except in the Lower Gorge, as discussed beginning on page 65).

SUMMARY OF ACTUAL YEARLY USE — ALTERNATIVE A

Alternative A			Commercial			Noncommercial		
			Motor	No-Motor	Total	Standard	Small	Total
User-Days	Total	Summer	65,682	26,886	92,568	29,301	0	29,301
		Shoulder	8,578	11,937	20,515	22,588	0	22,588
		Winter	0	0	0	6,159	0	6,159
		Full Year	74,260	38,823	113,083	58,048	0	58,048
Trips Launching	Total	Summer	417	117	534	129	0	129
		Shoulder	56	50	107	97	0	97
		Winter	0	0	0	28	0	28
		Full Year	473	167	640	253	0	253
Recreational Passengers	Total	Summer	12,970	3,275	16,245	1,883	0	1,883
		Shoulder	1,517	1,129	2,646	1,370	0	1,370
		Winter	0	0	0	318	0	318
		Full Year	14,487	4,404	18,891	3,570	0	3,570

NOTE: These are nearest whole numbers. Totals reflect cumulative fractional differences.

ALTERNATIVE B

Alternative B is a no-motor alternative characterized by the lowest group sizes, least number of maximum daily launches, and substantially lower numbers of probable yearly passengers (12,894). Included in this alternative is a limited increase in winter recreational use. There would be no helicopter exchanges at Whitmore.

WHAT THIS ALTERNATIVE ACCOMPLISHES

Carrying Capacity Standards

- The maximum number of trips at one time would be reduced to 60 (from 70).
- The maximum number of people at one time would be reduced to 877 (from 1,095).
- Total user discretionary time in hours per year would be increased to 576,754 (from 355,081).

March-to-October Overall Use

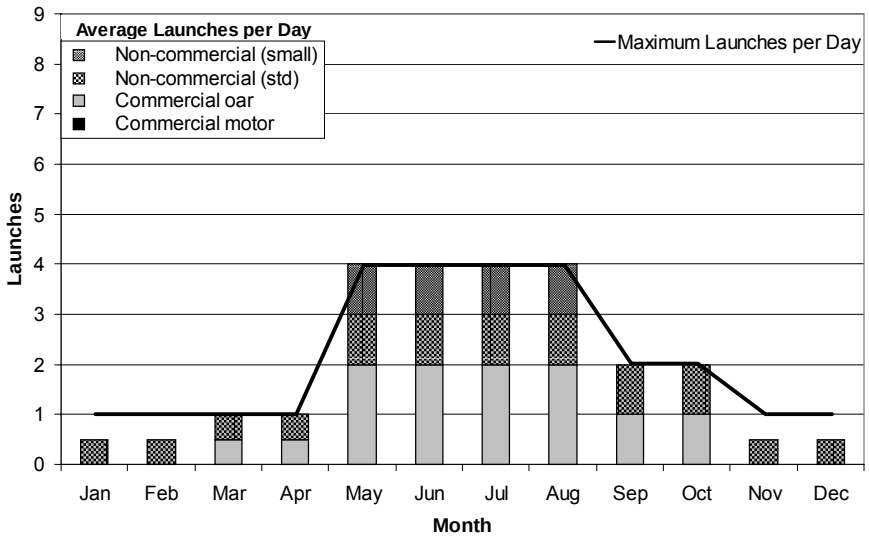
- The number of probable recreational passengers would be reduced to 11,967 (from 22,143).
- The number of probable trips launching would be reduced to 675 (from 866), the lowest launch levels in the summer and shoulder seasons.
- The number of probable user-days would be reduced to 157,759 (from 164,972).

KEY TRIP VARIABLES

Launches per Day

- Launches per day would be reduced from nine to a maximum of four during the summer peak season (two commercial oar, one noncommercial standard, one noncommercial small). Figure 2-3 shows both the average launches per day per trip type, as well as the maximum launches per day.

FIGURE 2-3: AVERAGE AND MAXIMUM LAUNCHES PER DAY BY TRIP TYPE — ALTERNATIVE B



Maximum Group Sizes (includes guides)

- Commercial motor trips would be eliminated, as this is a no-motor alternative.
- Commercial non-motorized trip sizes would be reduced to 25 people from 39.
- Noncommercial trip sizes would remain at the current level of 16 (standard) and a new group size of 8 (small) would be offered to better utilize small camping beaches.

Maximum Trip Lengths (in number of days)

- Commercial motor trips would be eliminated, as this is a no-motor alternative.
- The maximum number of days for commercial non-motorized trips would be reduced to 16 days in summer (from 18), 18 days in the shoulder seasons (from 21), and 0 days in winter (from 30).
- The maximum number of days for noncommercial oar trips would be reduced to 16 days in summer (from 18), 18 days in the shoulder seasons (from 21), and 18 days in winter (from 30).

March-to-October User-Day Limits:

- Commercial motor use would be eliminated, as this is no-motor alternative.
- Commercial overall use would be capped at the current 115,500 user days.
- Noncommercial use would not be capped, increasing to a probable 60,064 user-days (from 51,889).

Winter Use

- Winter use would increase to accommodate approximately 927 people (from 318).

OTHER ISSUES

Mixed Use / Non-motorized Seasonal Use

- The non-motorized season would be increased to year-round, with no motorized use allowed (currently motors may be used nine months a year).

Whitmore Exchanges

- Because this is a no-motor alternative, no exchanges would be allowed at Whitmore.

SUMMARY OF PROBABLE YEARLY USE — ALTERNATIVE B

Alternative B			Commercial			Noncommercial		
			Motor	Non-Motor	Total	Standard	Small	Total
User-Days	Total	Summer	0	69,746	69,746	27,142	10,531	37,673
		Shoulder	0	27,948	27,948	22,391	0	22,391
		Winter	0	0	0	14,459	0	14,459
		Full Year	0	97,694	97,694	63,992	10,531	74,523
Trips Launching	Total	Summer	0	246	246	123	123	246
		Shoulder	0	92	92	92	0	92
		Winter	0	0	0	60	0	60
		Full Year	0	338	338	275	123	398
Recreational Passengers	Total	Summer	0	5,853	5,853	1,901	738	2,639
		Shoulder	0	2,061	2,061	1,414	0	1,414
		Winter	0	0	0	927	0	927
		Full Year	0	7,914	7,914	4,243	738	4,980

NOTE: These are nearest whole numbers. Totals reflect cumulative fractional differences.

ALTERNATIVE C

Alternative C is a no-motor alternative characterized by reduced group sizes and maximum daily launches (except in winter), and an increase in the number of probable yearly passengers (25,228). Included in this alternative is a substantial increase in shoulder and winter season use. There would be no helicopter exchanges at Whitmore.

WHAT THIS ALTERNATIVE ACCOMPLISHES:

Carrying Capacity Standards

- The maximum number of trips at one time would be reduced to 60 (from 70).
- The maximum number of people at one time would be reduced to 900 (from 1,095).
- Total user discretionary time in hours per year would be increased to 752,496 (from 355,081).

March-to-October Overall Use

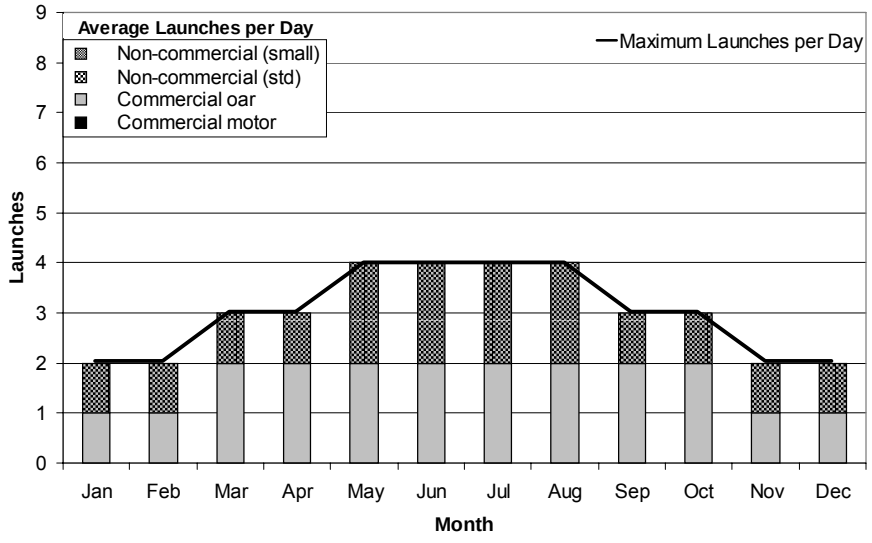
- The number of probable recreational passengers would be reduced to 20,201 (from 22,143).
- The number of probable trips launching would be reduced to 854 (from 866).
- The number of probable user-days would be increased to 199,639 (from 164,972).

KEY TRIP VARIABLES

Launches per Day

- Launches per day would be decreased from nine to a maximum of four during the summer peak season (two commercial oar, two noncommercial standard). Figure 2-4 shows the launches per day by trip type for each month.

FIGURE 2-4: AVERAGE AND MAXIMUM LAUNCHES PER DAY BY TRIP TYPE — ALTERNATIVE C



Maximum Group Sizes (includes guides)

- Commercial motor trips would be eliminated, as this is a no-motor alternative.
- Commercial oar trip sizes would be reduced to 30 people (from 39).
- Noncommercial motor trips would be eliminated, as this is a no-motor alternative.
- Noncommercial oar trip sizes would remain at 16 people (standard).

Maximum Trip Lengths (in number of days)

- Commercial motor trips would be eliminated, as this is a no-motor alternative.
- The maximum number of days for commercial non-motorized trips would be reduced to 16 days in summer (from 18), 18 days in the shoulder seasons (from 21), and 21 days in winter (from 30).
- The maximum number of days for noncommercial oar trips would be reduced to 16 days in summer (from 18), 18 days in the shoulder seasons (from 21), and 21 days in winter (from 30).

March-to-October User-Day Limits

- Commercial motor use would be eliminated, as this is a no-motor alternative.
- Commercial overall use would be capped at the current 115,500 user-days.
- Noncommercial use would not be capped, increasing to a probable use of 84,139 user-days (from 51,889).

Winter Use

- Winter use would increase to accommodate approximately 5,027 people per year (from 318).

OTHER ISSUES

Mixed Use / Non-motorized Seasonal Use

- The non-motorized season would be increased to year-round, with no motorized use allowed (currently motors may be used nine months a year).

Whitmore Exchanges

- Because this is a no-motor alternative, there would be no helicopter exchanges at Whitmore. Hiking exchanges would be limited from March through October to 2,500 passengers in and 2,500 passengers out.

SUMMARY OF PROBABLE YEARLY USE — ALTERNATIVE C

Alternative C			Commercial			Noncommercial		
			Motor	Non-Motor	Total	Standard	Small	Total
User-Days	Total	Summer	0	55,836	55,836	54,284	0	54,284
		Shoulder	0	59,664	59,664	29,855	0	29,855
		Winter	0	51,315	51,315	31,644	0	31,644
		Full Year	0	166,814	166,814	115,783	0	115,783
Trips Launching	Total	Summer	0	243	243	246	0	246
		Shoulder	0	243	243	122	0	122
		Winter	0	120	120	120	0	120
		Full Year	0	606	606	488	0	488
Recreational Passengers	Total	Summer	0	7,450	7,450	3,802	0	3,802
		Shoulder	0	7,064	7,064	1,886	0	1,886
		Winter	0	3,172	3,172	1,855	0	1,855
		Full Year	0	17,685	17,685	7,543	0	7,543

NOTE: These are nearest whole numbers. Totals reflect cumulative fractional differences.

ALTERNATIVE D

Alternative D is a mixed motor/non-motor alternative. the shoulder months of March–April and September–October would be for non-motorized use, with mixed use allowed in the remaining months. This alternative is characterized by the lowest allowable group sizes, reduced maximum daily launches, and a reduction in probable yearly passenger totals (20,427). There would be no helicopter exchanges at Whitmore.

WHAT THIS ALTERNATIVE ACCOMPLISHES

Carrying Capacity Standards:

- The maximum number of trips at one time would be reduced to 58 (from 70).
- The maximum number of people at one time would be reduced to 890 (from 1,095).
- Total user discretionary time in hours per year would be increased to 710,079 (from 355,081).

March-to-October Overall Use

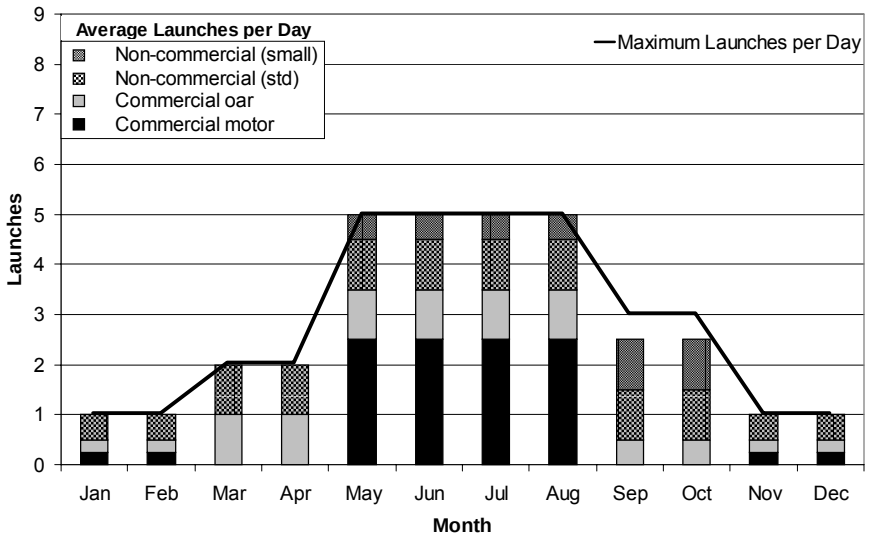
- The number of probable recreational passengers would be reduced to 18,186 (from 22,143).
- The number of probable trips launching would be increased to 890 (from 866).
- The number of probable user-days would be increased to 183,555 (from 164,972).

KEY TRIP VARIABLES

Launches per Day

- Launches per day would be decreased from nine to a maximum of five during the summer peak season. Figure 2-5 shows the launches per day by trip type for each month.

FIGURE 2-5: AVERAGE AND MAXIMUM LAUNCHES PER DAY BY TRIP TYPE — ALTERNATIVE D



Maximum Group Sizes (includes guides)

- Commercial motor trip sizes would be reduced to 25 people (from 43).
- Commercial oar trip sizes would be reduced to 25 people (from 39).
- Noncommercial trip sizes would remain at 16 people (standard), and a new group size of 8 people (small) would be offered to better distribute groups along the river.

Maximum Trip Lengths (in number of days)

- The maximum number of days for commercial motor trips would be reduced to 10 days in summer and shoulder seasons (from 18 in both), and to 18 days in winter (from 30).
- The maximum number of days for commercial oar trips would be reduced to 16 days in summer (from 18), 18 days in shoulder seasons (from 21), and 21 days in winter (from 30).
- The maximum number of days for noncommercial oar and motor trips would be reduced to 16 days in summer (from 18) and 18 days in the shoulder seasons (from 21). In winter the maximum number of days for noncommercial oar trips would be 30 days (same as now) and for noncommercial motor trips 18 days (from 30).

March-to-October User-Day Limits

- Commercial motorized use would be reduced to 58,927 user-days (from 76,240).
- Commercial overall use would be capped at the current 115,500 user-days.
- Noncommercial use would not be capped, increasing to a probable 68,055 user-days (from 51,889).

Winter Use

- Winter use would increase to accommodate approximately 2,242 people per year (from 318).

OTHER ISSUES

Mixed Use / Non-motorized Seasonal Use

- The mixed-use use season would be changed to a total of eight months in winter and summer (one less month than currently).
- The non-motorized use season would be changed to the spring and fall months, for a total of four months (one more month than currently).

Whitmore Exchanges

- There would be no helicopter exchanges at Whitmore. Hiking exchanges would be limited from March through October to 2,500 passengers in and 2,500 passengers out.

SUMMARY OF PROBABLE YEARLY USE — ALTERNATIVE D

Alternative D			Commercial			Noncommercial		
			Motor	Non-Motor	Total	Standard	Small	Total
User-Days	Total	Summer	58,927	31,405	90,332	27,142	5,266	32,407
		Shoulder	0	25,168	25,168	29,855	5,792	35,647
		Winter	11,177	10,691	21,868	17,891	0	17,891
		Full Year	70,104	67,264	137,368	74,888	11,057	85,946
Trips Launching	Total	Summer	308	123	431	123	62	185
		Shoulder	0	92	92	122	61	183
		Winter	30	30	60	60	0	60
		Full Year	338	245	582	305	123	428
Recreational Passengers	Total	Summer	8,415	3,080	11,495	1,901	369	2,270
		Shoulder	0	2,169	2,169	1,886	366	2,252
		Winter	664	651	1,315	927	0	927
		Full Year	9,079	5,900	14,979	4,714	735	5,449

NOTE: These are nearest whole numbers. Totals reflect cumulative fractional differences.

ALTERNATIVE E

Alternative E is a mixed motor/non-motor alternative. A six-month mixed-use season would be allowed from April to September, with the remaining six months reserved for non-motorized use. This alternative is characterized by a reduction in group size and launches per day (except in the winter season), and an increase in probable yearly passenger totals (23,812). Helicopter exchanges at Whitmore would be allowed form April through September.

WHAT THIS ALTERNATIVE ACCOMPLISHES

Carrying Capacity Standards

- The maximum number of trips at one time would be reduced to 60 (from 70).
- The maximum number of people at one time would be reduced to 972 (from 1,095).
- Total user discretionary time in hours per year would be increased to 569,603 (from 355,081).

March-to-October Overall Use

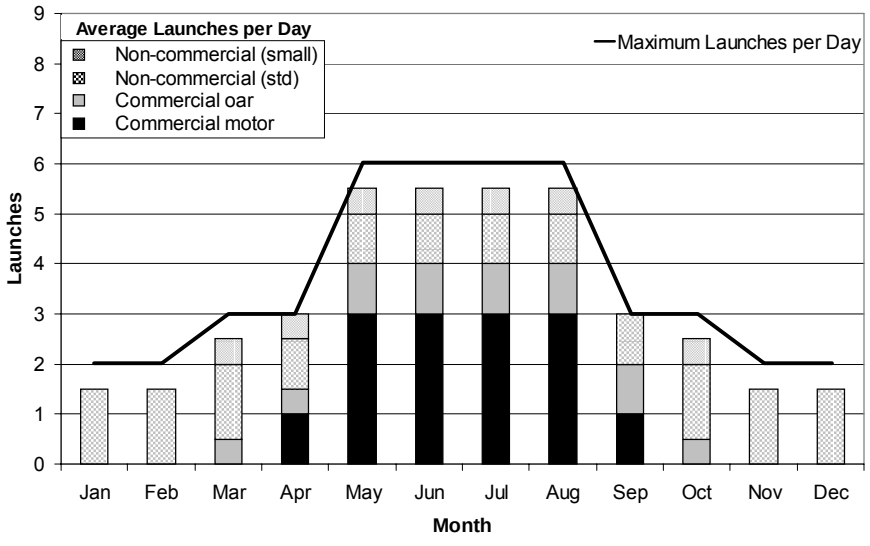
- The number of probable recreational passengers would be reduced to 21,030 (from 22,143).
- The number of probable trips launching would be increased to 993 (from 866).
- The number of probable user-days would be increased to 189,716 (from 164,972).

KEY TRIP VARIABLES

Launches per Day

- Launches per day would be decreased from a maximum of nine to six during the summer peak season (five every other day). Figure 2-6 shows the launches per day by trip type for each month.

FIGURE 2-6: AVERAGE AND MAXIMUM LAUNCHES PER DAY BY TRIP TYPE — ALTERNATIVE E



Maximum Group Sizes (includes guides)

- Commercial motor trips sizes would be reduced to 30 people (from 43).
- Commercial oar trip sizes would be reduced to 25 people (from 39).
- Noncommercial trip sizes would remain at 16 people (standard), and a new group size of 8 (small) would be offered to better distribute groups along the river.

Maximum Trip Lengths (in number of days)

- The maximum number of days for commercial motor trips would be reduced to 8 days in summer and the shoulder seasons (from 18); no winter use would be allowed (30 days now).
- The maximum number of days for commercial oar trips would be reduced to 14 days in summer (from 18) and 16 days in the shoulder seasons (from 21); no winter would be allowed (30 days currently allowed).
- The maximum number of days for noncommercial oar trips would be reduced to 16 days in summer (from 18), 18 days in the shoulder seasons (from 21), and 21 days in winter (from 30); no noncommercial motor trips would be allowed in winter (from 30 days now).

March-to-October User-Day Limits

- Commercial motorized use would remain at the current 74,260 user-days.
- Commercial overall use would be capped at the current 115,500 user-days.
- Noncommercial use would not be capped, increasing to a probable 74,217 user-days (from 51,889).

Winter Use

- Winter use would increase to accommodate approximately 2,782 people per year (from 318).

OTHER ISSUES

Mixed Use / Non-motorized Seasonal Use

- The mixed-use use season would be changed to April through September, for a total of six months (three fewer less months than currently).
- The non-motorized use season would be changed to October through March, for a total of six months (three more months than currently).

Whitmore Exchanges

- Helicopter exchanges would be allowed at Whitmore during the six-month motorized use season for a total of 2,500 passengers out and 2,500 passengers in; hiking exchanges would be allowed year-round.

SUMMARY OF PROBABLE YEARLY USE — ALTERNATIVE E

Alternative E			Commercial			Noncommercial		
			Motor	Non-Motor	Total	Standard	Small	Total
User-Days	Total	Summer	66,409	23,020	89,429	27,142	5,266	32,407
		Shoulder	10,503	15,567	26,070	37,441	4,368	41,809
		Winter	0	0	0	47,466	0	47,466
		Full Year	76,913	38,587	115,500	112,050	9,633	121,683
Trips Launching	Total	Summer	369	108	477	123	62	185
		Shoulder	60	72	132	153	46	199
		Winter	0	0	0	180	0	180
		Full Year	429	180	609	456	108	564
Recreational Passengers	Total	Summer	10,288	2,672	12,960	1,901	369	2,270
		Shoulder	1,488	1,672	3,159	2,365	276	2,641
		Winter	0	0	0	2,782	0	2,782
		Full Year	11,776	4,344	16,120	7,048	645	7,693

NOTE: These are nearest whole numbers. Totals reflect cumulative fractional differences.

ALTERNATIVE F

Alternative F is a mixed motor/non-motor alternative that would split the year in half, with mixed use allowed in the first half (January–June), and non-motorized use in the second half (July-December). It is characterized by lower group sizes and a decrease in launches per day (except in the winter season), and an increase in probable yearly passenger totals (25,415). Helicopter exchanges at Whitmore would be allowed from January through June.

WHAT THIS ALTERNATIVE ACCOMPLISHES

Carrying Capacity Standards

- The maximum number of trips at one time would be reduced to 54 (from 70).
- The maximum number of people at one time would be reduced to 972 (from 1,095).
- Total user discretionary time in hours per year would be increased to 518,889 (from 355,081).

March-to-October Overall Use

- The number of probable recreational passengers would be increased to 22,321 (from 22,143).

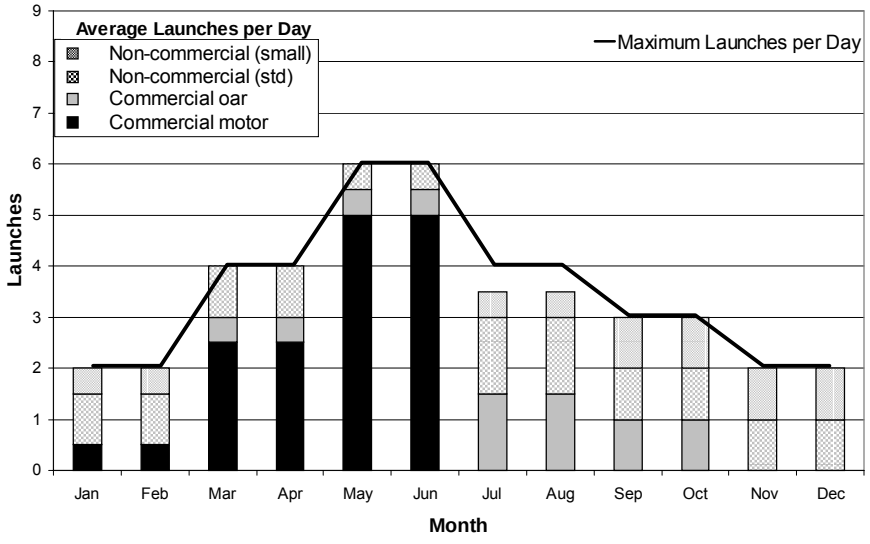
- The number of probable trips launching would be increased to 991 (from 866).
- The number of probable user-days would be increased to 181,053 (from 164,972).

KEY TRIP VARIABLES

Launches per Day

- Launches per day would be decreased from a maximum of nine to six. Figure 2-7 shows the launches per day by trip type for each month.

FIGURE 2-7: AVERAGE AND MAXIMUM LAUNCHES PER DAY BY TRIP TYPE — ALTERNATIVE F



Maximum Group Sizes (includes guides)

- Commercial motor trips sizes would be reduced to 30 people (from 43).
- Commercial oar trip sizes would be reduced to 30 people (from 39).
- Noncommercial trip sizes would remain at 16 people (standard), and a new group size of 8 (small) would be offered to better distribute groups along the river.

Maximum Trip Lengths (in number of days)

- The maximum number of days for commercial motor trips would be reduced to 10 days in summer and the shoulder seasons (from 18) and 18 days in winter (from 30).
- The maximum number of days for commercial oar trips would be reduced to 16 days in summer (from 18), 18 days in the shoulder seasons (from 21), and 21 days in winter (from 30).
- The maximum number of days for noncommercial oar and motor trips would be reduced to 16 days in summer (from 18) and 18 days in the shoulder seasons (from 21). In winter the maximum number of days for noncommercial oar trips would be 21 days (from 30) and for noncommercial motor trips 18 days (from 30).

March-to-October User-Day Limits

- Commercial motor use would decrease to 69,886 user-days (from 74,260).
- Commercial overall use would be capped at the current 115,500 user-days.
- Noncommercial use would not be capped, increasing to a probable 65,554 user-days (from 51,889).

Winter Use

- Winter use would increase to accommodate approximately 3,094 people per year (from 318).

OTHER ISSUES

Mixed Use / Non-motorized Seasonal Use

- The six-month mixed-use season would run from January through June (three fewer months than currently).
- The six-month non-motorized use season would run from July through December (three more months than currently).

Whitmore Exchanges

- Helicopter exchanges would be allowed during the six-month motorized use season, for a total of 6,600 passengers out and 3,400 passengers in; hiking exchanges would be allowed year-round.

SUMMARY OF PROBABLE YEARLY USE — ALTERNATIVE F

Alternative F			Commercial			Noncommercial		
			Motor	Non-Motor	Total	Standard	Small	Total
User-Days	Total	Summer	47,019	25,366	72,385	27,252	2,654	29,906
		Shoulder	22,868	20,247	43,115	29,855	5,792	35,647
		Winter	13,189	0	13,189	31,644	9,260	40,904
		Full Year	83,076	45,613	128,689	88,752	17,706	106,457
Trips Launching	Total	Summer	305	110	415	124	31	155
		Shoulder	153	85	238	122	61	183
		Winter	30	0	30	120	91	211
		Full Year	487	196	683	366	183	548
Recreational Passengers	Total	Summer	8,931	2,928	11,859	1,909	186	2,095
		Shoulder	3,972	2,144	6,116	1,886	366	2,252
		Winter	696	0	696	1,855	543	2,398
		Full Year	13,599	5,072	18,671	5,649	1,094	6,744

NOTE: These are nearest whole numbers. Totals reflect cumulative fractional differences.

ALTERNATIVE G

Alternative G is a mixed motor/non-motor alternative, with mixed use allowed for eight months and non-motorized use for four months (September–December). It is characterized by slightly smaller maximum group sizes, the highest level of allowable daily launches of all the action alternatives, and the highest number of probable yearly passengers (28,680). Helicopter exchanges at Whitmore would be allowed from January through August.

WHAT THIS ALTERNATIVE ACCOMPLISHES

Carrying Capacity Standards

- The maximum number of trips at one time would be reduced to 53 (from 70).
- The maximum number of people at one time would be reduced to 895 (from 1,095).
- Total user discretionary hours in hours per year would be increased to 421,073 (from 355,081).

March-to-October Overall Use

- The number of probable recreational passengers would be increased to 24,970 (from 22,143).

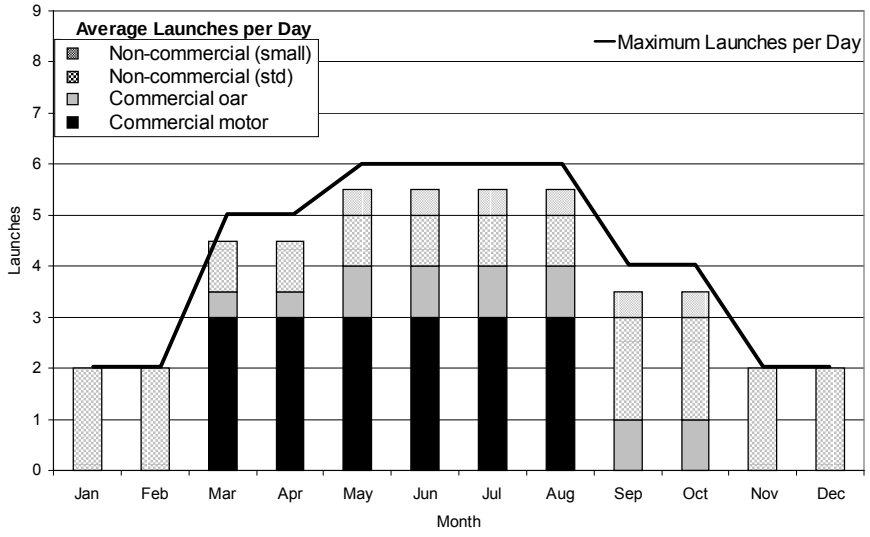
- The number of probable trips launching would be increased to 1,077 (from 866).
- The number of probable user-days would be increased to 187,587 (from 164,972).

KEY TRIP VARIABLES

Launches per Day

- Launches per day would be decreased from nine to a maximum of six during the peak summer season. Figure 2-8 shows the launches per day by trip type for each month.

FIGURE 2-8: AVERAGE AND MAXIMUM LAUNCHES PER DAY BY TRIP TYPE — ALTERNATIVE G



Maximum Group Sizes (includes guides)

- Commercial motor trip sizes would be reduced to 40 people (from 43).
- Commercial oar trip sizes would be reduced to 30 people (from 39).
- Noncommercial trip sizes would remain at 16 people (standard), and a new group size of 8 (small) would be offered to better distribute groups along the river.

Maximum Trip Lengths (in numbers of days)

- The maximum number of days for commercial motor trips would be reduced to 8 days in the summer and shoulder seasons (from 18); no commercial motor trips would be offered in winter (30 days currently allowed).
- The maximum number of days for commercial oar trips would be reduced to 14 days in summer (from 18) and 16 days in the shoulder seasons (from 21); no commercial oar trips would be allowed in winter (from 30 days now).
- The maximum number of days for noncommercial oar and motor trips would be reduced to 14 days in summer (from 18) and 16 days in the shoulder seasons (from 21). In winter the maximum number of days for noncommercial oar trips would be 21 days (from 30) and for noncommercial motor trips 18 days (from 30).

March-to-October User-Day Limits

- Commercial motorized use would be capped at the current 74,260 user-days.
- Commercial overall use would be capped at the current 115,500 user-days.
- Noncommercial use would not be capped, increasing to 72,087 user-days (from 51,889).

Winter Use

- Winter use would increase to accommodate approximately 3,710 people per year (from 318)

OTHER ISSUES

Mixed Use / Non-motorized Seasonal Use

- The mixed-use use season would be January through August, for a total of eight months (one less month than currently).
- The non-motorized use season would be September through December, for a total of four months (one more month than currently).

Whitmore Exchanges

- Helicopter exchanges would be allowed during the eight-month motorized use season, for a total of 7,200 passengers out and 3,700 passengers in; hiking exchanges would be allowed year-round.

SUMMARY OF PROBABLE YEARLY USE — ALTERNATIVE G

Alternative G			Commercial			Noncommercial		
			Motor	Non-Motor	Total	Standard	Small	Total
User-Days	Total	Summer	51,884	21,270	73,154	24,146	4,684	28,830
		Shoulder	25,029	17,317	42,346	40,630	2,627	43,257
		Winter	0	0	0	62,323	0	62,323
		Full Year	76,913	38,587	115,500	127,099	7,312	134,410
Trips Launching	Total	Summer	325	94	419	123	62	185
		Shoulder	183	77	260	183	31	214
		Winter	0	0	0	240	0	240
		Full Year	508	171	679	546	92	638
Recreational Passengers	Total	Summer	10,178	2,491	12,669	1,901	369	2,270
		Shoulder	5,078	1,941	7,020	2,829	183	3,011
		Winter	0	0	0	3,710	0	3,710
		Full Year	15,256	4,432	19,688	8,439	552	8,991

NOTE: These are nearest whole numbers. Totals reflect cumulative fractional differences.

ALTERNATIVE H: NPS PREFERRED ALTERNATIVE

Alternative H is the NPS preferred alternative. It is a mixed motor/non-motor alternative that would divide the year into two 6-month periods, with mixed use occurring from March through October, and non-motorized use from September through February. It is characterized by lower group sizes and fewer daily launches except during the winter months, when launches would be the same as current conditions. This alternative would allow for a substantial increase in probable yearly passenger totals (26,317). Helicopter exchanges at Whitmore would be allowed from May through August.

WHAT THIS ALTERNATIVE ACCOMPLISHES

Carrying Capacity Standards

- The maximum number of trips at one time would be reduced to 60 (from 70).
- The maximum number of people at one time would be reduced to 982 (from 1,095).
- Total user discretionary time in hours per year would be increased to 554,103 (from 355,081).

March-to-October Overall Use

- The number of probable recreational passengers would be increased to 24,461 (from 22,143).

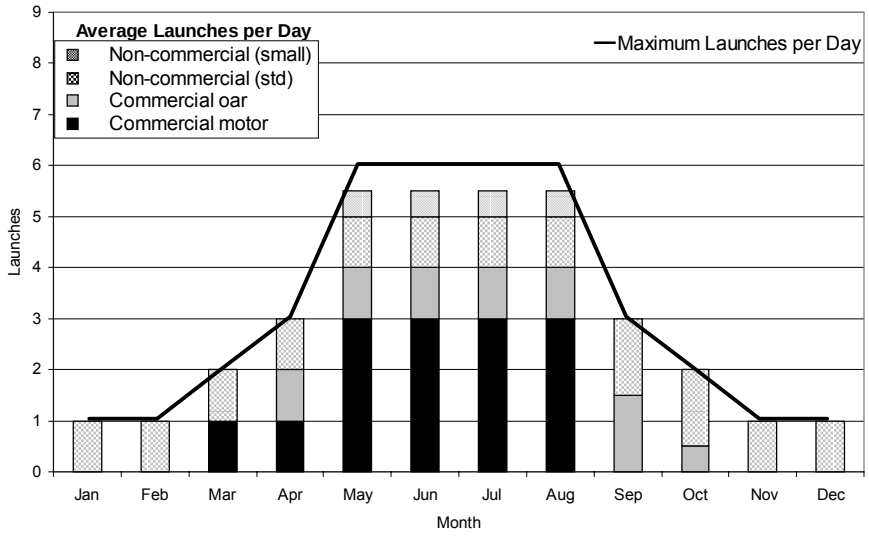
- The number of probable trips launching would be increased to 936 (from 866).
- The number of probable user-days would be increased to 184,398 (from 164,972).

KEY TRIP VARIABLES

Launches per Day

- Launches per day would be decreased to a maximum of six (from nine). Figure 2-9 shows the launches per day by trip type for each month.

FIGURE 2-9: AVERAGE AND MAXIMUM LAUNCHES PER DAY BY TRIP TYPE — ALTERNATIVE H



Maximum Group Sizes (includes guides)

- Commercial motor trip sizes would be reduced to 32 people in the summer and 24 people during the rest of the year (from 43).
- Commercial oar trip sizes would be reduced to 32 people in the summer and 24 people during the rest of the year (from 39).
- Noncommercial trip sizes would remain at the current level of 16 people (standard), and a new group size of 8 (small) would be offered to better distribute groups along the river.

Maximum Trip Lengths (in number of days)

- The maximum trip length for commercial motor trips would be reduced to 10 days in summer and shoulder seasons (from 18); no winter commercial motor trips (from 30 days currently).
- The maximum trip length for commercial oar trips would be reduced to 16 days in summer (from 18), 18 days in the shoulder seasons (from 21), and 21 days in the winter (from 30).
- The maximum noncommercial oar and motor trip length would be reduced to 16 days in summer (from 30) and 18 days in the shoulder seasons (from 21). In winter noncommercial oar trips would be reduced to 25 days (from 30), and no motor trips would be allowed.

March-to-October User-Day Limits

- Commercial motorized use would be capped at the current 74,260 user-days.
- Commercial overall use would be capped at the current 115,500 user-days.
- Noncommercial use would not be capped, increasing to 68,897 user-days (from 51,889).

Winter Use

- Winter use would increase to accommodate approximately 1,855 people per year (from 318).

OTHER ISSUES

Mixed Use / Non-motorized Seasonal Use

- The mixed-use use season would decrease to six months (March through August).
- The non-motorized use season would increase to 6 months (September through February)

Whitmore Exchanges

- Helicopter exchanges would be allowed during the four-month summer peak season for a total of 5,000 passengers out and up to 5,000 passengers in (provided the exchanges are 1:1); hiking exchanges would be allowed during the shoulder seasons for a total of 1,250 passengers out and 1,250 passengers in during the summer and winter months.

SUMMARY OF PROBABLE YEARLY USE — ALTERNATIVE H

Alternative H			Commercial			Noncommercial		
			Motor	Non-Motor	Total	Standard	Small	Total
User-Days	Total	Summer	68,636	24,200	92,836	27,142	5,266	32,407
		Shoulder	8,277	14,387	22,664	36,490	0	36,490
		Winter	0	0	0	33,828	0	33,828
		Full Year	76,913	38,587	115,500	97,459	5,266	102,725
Trips Launching	Total	Summer	369	106	475	123	62	185
		Shoulder	61	63	124	153	0	153
		Winter	0	0	0	120	0	120
		Full Year	430	169	599	396	62	457
Recreational Passengers	Total	Summer	12,964	2,898	15,862	1,901	369	2,270
		Shoulder	1,845	2,128	3,973	2,357	0	2,357
		Winter	0	0	0	1,855	0	1,855
		Full Year	14,809	5,026	19,834	6,113	369	6,482

NOTE: These are nearest whole numbers. Totals reflect cumulative fractional differences.

SUMMARY OF THE LEES FERRY ALTERNATIVES

TABLE 2-3: COMPARISON OF ALTERNATIVES — LEES FERRY TO DIAMOND CREEK

	Alternatives							
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Motors Allowed?								
January	Yes	No	No	Yes	No	Yes	Yes	No
February	Yes	No	No	Yes	No	Yes	Yes	No
March	Yes	No	No	No	No	Yes	Yes	Yes
April	Yes	No	No	No	Yes	Yes	Yes	Yes
May	Yes	No	No	Yes	Yes	Yes	Yes	Yes
June	Yes	No	No	Yes	Yes	Yes	Yes	Yes
July	Yes	No	No	Yes	Yes	No	Yes	Yes
August	Yes	No	No	Yes	Yes	No	Yes	Yes
September	Yes/No*	No	No	No	Yes	No	No	No
October	No	No	No	No	No	No	No	No
November	No	No	No	Yes	No	No	No	No
December	No/Yes*	No	No	Yes	No	No	No	No
Maximum Trip Length (in number of days)								
Summer (May–August)								
Commercial Motor	18	0	0	10	8	10	8	10
Commercial Oar	18	16	16	16	14	16	14	16
Noncommercial Oar/Motor	18	16	16	16	16	16	14	16
Shoulder Seasons (March–April / September–October)								
Commercial Motor	18	0	0	10	8	10	8	10
Commercial Oar	21	18	18	18	16	18	16	18
Noncommercial Oar/Motor	21	18	18	18	18	18	16	18
Winter (November–February)								
Commercial Motor	30	0	0	18	0	18	0	0
Commercial Oar	30	0	21	21	0	21	0	21
Noncommercial Motor	30	0	0	18	0	18	18	0
Noncommercial Oar	30	18	21	30	21	21	21	25
Maximum Group Size								
Commercial Motor	43	0	0	25	30	30	40	32/24**
Commercial Oar	39	25	30	25	25	30	30	32/24**
Noncommercial Standard	16	16	16	16	16	16	16	16
Noncommercial Small	0	8	0	8	8	8	8	8
Probable Number of Launches								
Summer	663	492	489	615	662	570	603	659
Shoulder Seasons	204	183	365	275	331	421	474	277
Winter	28	60	240	120	180	240	240	120
Total	**894**	**735**	**1,094**	**1,010**	**1,173**	**1,231**	**1,317**	**1,056**
Probable Number of Passengers								
Summer	18,127	8,492	11,252	13,765	15,230	13,954	14,939	18,132
Shoulder Seasons	4,016	3,475	8,949	4,420	5,800	8,367	10,031	6,330
Winter	318	927	5,027	2,242	2,782	3,094	3,710	1,855
Total	**22,461**	**12,894**	**25,228**	**20,427**	**23,812**	**25,415**	**28,680**	**26,317**
Probable User-Days								
Summer	121,869	107,419	110,120	122,739	121,837	102,292	101,984	125,243
Shoulder Seasons	43,103	50,340	89,519	60,816	67,879	78,762	85,603	59,154
Winter	6,159	14,459	82,959	39,759	47,466	54,093	62,323	33,828
Total	**171,131**	**172,218**	**282,598**	**223,314**	**237,182**	**235,147**	**249,910**	**218,225**
Whitmore Exchanges								
By Helicopter								
Passengers out	6,800	0	0	0	2,500	6,600	7,200	5,000
Passengers in	3,500	0	0	0	2,500	3,400	3,700	5,000

	Alternatives							
	A	B	C	D	E	F	G	H
By Hiking* **								
Passengers in	≈ 0	0	2,500	2,500	≈ 0	≈ 0	≈ 0	1,250
Passengers out	≈ 0	0	2,500	2,500	≈ 0	≈ 0	≈ 0	1,250
Allocation Split (Probable Commercial / Noncommercial Percentage of Annual Use)								
Launches	72 / 28	46 / 54	55 / 45	58 / 42	52 / 48	55 / 45	52 / 48	57 / 43
Passengers	84 / 16	61 / 39	70 / 30	73 / 27	68 / 32	73 / 27	69 /31	75 / 25
User-days	66 / 34	57 / 43	59 / 41	62 / 38	49 / 51	55 / 45	46 / 54	53 / 47

NOTE: These are nearest whole numbers. Totals reflect cumulative fractional differences.

* In September motor trips allowed until the 15th of the month; in December motor trips allowed after the 15th (½ motor and ½ no-motor month).

** Group Size = 32 in the summer months, 24 the rest of the year for commercial motor and oar trips.

*** Whitmore hiking exchanges are allowed today, but few people take advantage of the opportunity. This potential use is expected to continue in the alternatives where ≈ 0 is shown.

TABLE 2-4: SUMMARY COMPARISON OF ENVIRONMENTAL IMPACTS — LEES FERRY ALTERNATIVES

NOTE: No natural or cultural resources would be impaired as a result of alternatives considered in this *Draft Environmental Impact Statement.*

Impact Topic	Alternatives							
	A	B	C	D	E	F	G	H
Natural Resources								
•Soils	Adverse, localized, short- to long-term, seasonal to year-round, minor to major effects.	Adverse, localized, short- to long-term, year-round, minor to moderate effects.	Adverse, localized, short- to long-term, year-round, moderate to major effects.	Adverse, localized, short- to long-term, year-round, and moderate effects.	Adverse, localized, short- to long-term, year-round, and moderate effects.	Adverse, localized, short- to long-term, year-round, moderate effects.	Adverse, localized, short- to long-term, year-round, moderate to major effects.	Adverse, localized, short- to long-term, year-round, moderate effects.
•Water Quality	Adverse, localized, short-term, year-round, minor to moderate effects.	Adverse, localized, short-term, year-round, minor to moderate effects.	Adverse, localized, short-term, year-round, minor to moderate effects.	Adverse, localized, short-term, year-round, minor to moderate effects.	Adverse, localized, short-term, year-round, minor to moderate effects.	Adverse, localized, short-term, year-round, minor to moderate effects.	Adverse, localized, short-term, year-round, minor to moderate effects.	Adverse, localized, short-term, year-round, minor to moderate effects.
•Air Quality	Adverse, negligible, local effects on human health; and adverse, negligible contribution to major regional impacts on air quality related resources.	Beneficial, long-term, negligible to moderate effects on human health; and beneficial, negligible reduced contribution to adverse, major, regional effects on air quality related resources.	Beneficial, negligible to minor, local effects on human health; and beneficial, negligible effects by reducing contribution to adverse, major, regional effects on air quality related resources.	Beneficial, negligible, local effects on human health; and generally beneficial, negligible effects by reducing contributions to adverse, major, regional effects on air quality related resources.	Adverse, negligible, local to regional effects on human health; and adverse, negligible increased contributions to major, regional effects on air quality related resources.	Adverse, negligible, regional impacts on human health; and adverse, negligible contributions to major, regional, impacts on air quality related resources.	Adverse, negligible, regional impacts on human health; and adverse, negligible to minor contributions to major, regional, short- and long-term impacts on air quality related resources.	Adverse, negligible, regional impacts on human health; and adverse, negligible to minor contributions to major, adverse, regional, short- and long-term impacts on air quality related resources.
•Natural Soundscape	Overall adverse, localized, short-term, minor to moderate effects, with major adverse impacts at Whitmore.	Overall adverse, localized, short-term, negligible to minor effects, with no helicopter impacts at Whitmore.	Overall adverse, localized, short-term, minor effects, with no helicopter impacts at Whitmore.	Overall adverse, localized, short-term, minor to moderate effects, with no helicopter impacts at Whitmore.	Overall adverse, localized, short-term, minor to moderate effects, with adverse moderate to major impacts at Whitmore.	Overall adverse, localized, short-term, moderate effects, with adverse major impacts at Whitmore.	Overall adverse, localized, short-term, moderate effects, with adverse moderate to major impacts at Whitmore.	Overall adverse, localized, short-term, minor to moderate effects, with adverse moderate to major impacts at Whitmore.
•Cave and Paleontological Resources	Adverse, localized, year-round, long-term, minor to major effects.	Adverse, localized, year-round, long-term, negligible to moderate effects.	Adverse, localized, year-round, long-term, minor to moderate effects.	Adverse, localized, year-round, long-term, minor to moderate effects.	Adverse, localized, year-round, long-term, minor to moderate effects.	Adverse, localized, year-round, long-term, minor to moderate effects.	Adverse, localized, year-round, long-term, minor to major effects.	Adverse, localized, year-round, long-term, minor to moderate effects.

Impact Topic	Alternatives							
	A	B	C	D	E	F	G	H
•Vegetation	Adverse, localized, seasonal to year-round, short- to long-term, minor to major effects.	Adverse, localized, seasonal to year-round, short- to long-term, minor to moderate effects.	Adverse, localized, seasonal to year-round, short- to long-term, moderate effects.	Adverse, localized, seasonal to year-round, short- to long-term, minor to moderate effects.	Adverse, localized, seasonal to year-round, short- to long-term, moderate effects.	Adverse, localized, seasonal to year-round, short- to long-term, moderate effects.	Adverse, localized, seasonal to year-round, short- to long-term, moderate effects.	Adverse, localized, seasonal to year-round, short- to long-term, moderate effects.
•Terrestrial Wildlife	Adverse, regional and local, short and long-term, negligible to moderate effects.	Adverse, regional and local, short and long-term, negligible to major effects.	Adverse, regional and local, short and long-term, moderate to major effects.	Adverse, regional and local, short and long-term, moderate to major effects.	Adverse, regional and local, short and long-term, minor to moderate effects.	Adverse, regional and local, short and long-term, negligible to moderate effects.	Adverse, regional and local, short and long-term, negligible to moderate effects.	Adverse, regional and local, short and long-term, negligible to moderate effects.
•Aquatic Resources	Adverse, regional to localized, short- to long-term, seasonal, negligible to major effects.	Adverse, regional to localized, short- to long-term, seasonal, negligible to moderate effects.	Adverse, regional to localized, short- to long-term, seasonal, negligible to major effects.	Adverse, regional to localized, short- to long-term, seasonal, negligible to moderate effects.	Adverse, regional to localized, short- to long-term, seasonal, negligible to moderate effects.	Adverse, regional to localized, short- to long-term, seasonal, negligible to major effects.	Adverse, regional to localized, short- to long-term, seasonal, negligible to major effects.	Adverse, regional to localized, short- to long-term, seasonal, negligible to moderate effects.
•Threatened, Endangered, or Sensitive Species	Adverse, regional and local, short- and long-term, seasonal to year-round, and minor to moderate effects.	Adverse, regional and local, short- and long-term, seasonal to year-round, and minor to major effects.	Adverse, regional and local, short- and long-term, seasonal to year-round, and moderate to major effects.	Adverse, regional and local, short- and long-term, seasonal to year-round, and moderate to major effects.	Adverse, regional and local, short- and long-term, seasonal to year-round, and minor to moderate effects.	Adverse, regional and local, short- and long-term, seasonal to year-round, and minor to major effects.	Adverse, regional and local, short- and long-term, seasonal to year-round, and minor to major effects.	Adverse, regional and local, short- and long-term, seasonal to year-round, and minor to major effects.
Cultural Resources	Adverse, localized, short- to long-term, seasonal to year-round, minor to major effects.	Adverse, localized, long-term, year-round, negligible to moderate effects.	Adverse, localized, long-term, year-round, moderate to major effects.	Adverse, localized, long-term, year-round, moderate to major effects.	Adverse, localized, long-term, year-round, minor to moderate effects.	Adverse, localized, long-term, year-round, minor to major effects.	Adverse, localized, long-term, year-round, minor to major effects.	Adverse, localized, long-term, year-round, minor to moderate effects.
Visitor Experience	Adverse, localized to regional, short- to long-term, seasonal to year-round, negligible to major impacts for some users, with beneficial, localized to regional, short- to long-term, seasonal to year-round minor to moderate impacts for others.	Adverse, localized to regional, short- to long-term, seasonal to year-round, negligible to major impacts for some users, with beneficial, localized to regional, short- to long-term, seasonal to year-round, moderate to major impacts for others.	Adverse, localized to regional, short- to long-term, seasonal to year-round, negligible to major impacts for some users, with beneficial, localized to regional, short- to long-term, seasonal to year-round, minor to moderate impacts for others.	Adverse, localized to regional, short- to long-term, seasonal to year-round, negligible to major impacts for some users, with beneficial, localized to regional, short- to long-term, seasonal to year-round, minor to major impacts for others.	Adverse, localized to regional, short- to long-term, seasonal to year-round, negligible to major impacts for some users, with beneficial, localized to regional, short- to long-term, seasonal to year-round, minor to moderate impacts for others.	Adverse, localized to regional, short- to long-term, seasonal to year-round, negligible to major impacts for some users, with beneficial, localized to regional, short- to long-term, seasonal to year-round, minor impacts for others.	Adverse, localized to regional, short- to long-term, seasonal to year-round, negligible to major impacts for some users, with beneficial, localized to regional, short- to long-term, seasonal to year-round, minor impacts for others.	Adverse, localized to regional, short- to long-term, seasonal to year-round, negligible to moderate impacts for some users, with beneficial, localized to regional, short- to long-term, seasonal to year-round, minor to moderate impacts for others.

Impact Topic	Alternatives							
	A	B	C	D	E	F	G	H
Socioeconomic Resources	Direct and indirect impacts: negligible.	Adverse, long term, moderate to major for commercial river runners and Bar 10; adverse, long term, and minor for Hualapai tribal revenues. Negligible for the regional economy;	Beneficial, long-term, and major for commercial river runners; adverse, long term, and major for Bar 10; negligible for Hualapai tribal revenues. Negligible for the regional economy;	Beneficial, long-term, and major for commercial river runners; adverse, long term, and major for Bar 10; adverse, long term, and minor for Hualapai tribal revenues. Negligible for the regional economy;.	Beneficial, long-term, and minor for commercial river runners; adverse, long term, and major for Bar 10; negligible for Hualapai tribal revenues. Negligible for the regional economy.	Beneficial, long-term, and moderate for commercial river runners; negligible for Bar 10 and Hualapai tribal revenues. Negligible for the regional economy.	Beneficial, long-term, and minor for commercial river runners, Bar 10, and Hualapai tribal revenues. Negligible for the regional economy.	Beneficial, long-term, and minor for commercial river runners; beneficial, long term, and major for Bar 10; negligible for Hualapai tribal revenues. Negligible for the regional economy.
Park Management and Operations	Adverse, localized and regional, short-term, negligible to long-term moderate effects. Beneficial effects with additional funding and staff.	Adverse, localized and regional, short-term minor to long-term, moderate effects. Beneficial effects with additional funding and staff.	Adverse, localized and regional, short-term major to long-term, moderate effects. Beneficial effects with adequate funding and staff.	Adverse, localized and regional, short-term moderate to long-term minor effects. Beneficial effects with adequate funding and staff.	Adverse, localized and regional, short-term moderate to long-term minor effects. Beneficial effects with adequate funding and staff.	Adverse, localized and regional, short-term major, to long-term moderate effects. Beneficial effects with adequate funding and staff.	Adverse, localized and regional, short-term major and long-term major effects. Beneficial effects with adequate funding and staff.	Adverse, localized and regional, short-term moderate and long-term moderate effects. Beneficial effects with adequate funding and staff.
Adjacent Lands	Adverse, localized, seasonal, short-term, moderate effects.	Beneficial, localized, year-round, short to long-term, minor to moderate effects.	Beneficial, localized, year-round, short to long-term, minor to moderate effects.	Adverse minor to beneficial moderate, localized, year-round, short to long-term, effects.	Adverse minor to beneficial minor, localized, year-round, short to long-term, effects.	Adverse, localized, seasonal, short-term, minor to moderate effects.	Adverse, localized, seasonal, short-term, minor to moderate effects.	Adverse, localized, year-round, long-term, minor to moderate effects.

TABLE 2-5: HOW WELL THE ALTERNATIVES MEET COLORADO RIVER MANAGEMENT PLAN MANAGEMENT OBJECTIVES — LEES FERRY ALTERNATIVES

Resource / Management Objectives	Alternatives							
	A	B	C	D	E	F	G	H
Natural Resources								
Soils •Preserve and protect natural soil conditions by minimizing impacts to soils from river recreational activities.	Does not meet in the old high-water zone and would only be met in the new high-water zone by employing additional mitigations at greater levels because of large group sizes and long trips, as well as erratic launch patterns.	Meets because of low use levels, reduced group sizes and trip lengths, and evening out launch patterns, which would reduce impacts to soils.	Does not meet because the benefits gained by decreasing group size and trip length and evening out launch patterns would be offset by increased spring use. Impacts could not be reasonably mitigated to minor levels.	Meets because of reduced numbers of passengers, group sizes, and trip lengths; low use in spring would reduce soil impacts. Increased mitigation would be needed due to higher total number of users.	Meets because of reduced group sizes and trip lengths, and keeping use numbers in spring and summer similar to current conditions. Increased mitigation would be needed due to higher total number of users.	Does not meet because of doubling use in the spring, as well as the high motor use in spring and early summer. Impacts could not be reasonably mitigated to minor levels.	Does not meet because of the large group sizes, doubling of user days in the spring, and great increase in total use. Impacts could not be reasonably mitigated to minor levels.	Meets because reduced launches per day, trip lengths, and group sizes in the spring; low use in the spring would reduce impacts to soils. Increased mitigation would be needed due to higher total number of users.
Water Quality •Manage river recreation use in a manner that minimizes adverse chemical, physical, and biological changes to the water quality in the main stem of the Colorado River and its tributaries, seeps, and springs.	Does not meet due to spikes in use, large group sizes, and lack of focused management/ mitigation.	Meets (with reasonable mitigation) by eliminating use spikes and localized congestion.	Meets (with reasonable mitigation) by eliminating use spikes and localized congestion.	Meets (with reasonable mitigation) by eliminating use spikes and localized congestion.	Meets (with reasonable mitigation) by eliminating use spikes and localized congestion.	Meets (with reasonable mitigation) by eliminating use spikes and localized congestion.	Meets (with reasonable mitigation) by eliminating use spikes and localized congestion.	Meets (with reasonable mitigation) by eliminating use spikes and localized congestion.
Air Quality •Manage river recreational use to ensure that exhaust emissions from river recreation related vessels do not degrade ambient air quality or adversely affect air quality related values.	Meets because levels of motor use have a negligible contribution to air quality impacts.	Meets because no motors would have beneficial effects.	Meets because no motors would have beneficial effects.	Meets because there would be beneficial effects to air quality.	Meets because levels of motor use would have a negligible contribution to air quality impacts.	Meets because levels of motor use would have a negligible contribution to air quality impacts.	Meets because levels of motor use would have a negligible to minor contribution to air quality impacts.	Meets because levels of motor use would have a negligible to minor contribution to air quality impacts.

Resource / Management Objectives	Alternatives							
	A	B	C	D	E	F	G	H
Natural Soundscape •Manage river recreational use in a manner that is consistent with the management zoning while minimizing the adverse effects of human caused noise impacts to the natural soundscape or natural quiet.	Does not meet in peak season even with mitigation due to uneven launch patterns, large group sizes, highest launches per day, and motorboats and Whitmore helicopter use allowed nine months.	Exceeds in peak season with mitigation by eliminating motorboats and Whitmore helicopters, even launch patterns, reduced launches and group sizes, and opportunities for long periods of unaffected natural sounds even in peak season.	Exceeds in peak season with mitigation by eliminating motorboats and Whitmore helicopters, even launch patterns, reduced group sizes, and opportunities for long periods of unaffected natural sounds even in peak season.	Meets in peak season with mitigation by evening out launch patterns, reducing group sizes, allowing motorboats eight months per year, but eliminating Whitmore helicopters.	Meets in peak season with mitigation by evening out launch patterns, reducing trip lengths and group sizes, and allowing motorboats and Whitmore helicopters six months per year.	Does not meet in May and June even with mitigation due to very high motorboat levels. Meets objective during rest of year with mitigation by evening out launch patterns, reducing trip lengths, and allowing motorboats and Whitmore helicopters six months per year.	Does not meet even with mitigation due to very high launch levels in all seasons, second largest group sizes, and allowing motorboats and Whitmore helicopters eight months per year.	Meets in peak season with mitigation by evening out launch patterns, reducing trip lengths and group sizes, and allowing motorboats six months per year, but Whitmore helicopters only four months per year.
Caves and Paleontological Resources •Manage river use to ensure compliance with cave closures and provide for protection of caves and paleontological resources from adverse effects from visitation.	Does not meet due to spikes in visitation, large group sizes and lack of active site management. Effects cannot be reasonably mitigated.	Meets (with reasonable mitigation) by eliminating spikes in use and reducing group size.	Meets (with reasonable mitigation) by eliminating spikes in use and reducing group size.	Meets (with reasonable mitigation) by eliminating spikes in use and reducing group size.	Meets (with reasonable mitigation) by eliminating spikes in use and reducing group size.	Meets (with reasonable mitigation) by eliminating spikes in use and reducing group size.	Meets (with reasonable mitigation) by eliminating spikes in use and reducing group size.	Meets (with reasonable mitigation) by eliminating spikes in use and reducing group size.
Vegetation •Manage river recreational activities to minimize human-caused impacts to native vegetation, reduce the spread of exotic plant species, and preserve fundamental biological and physical processes.	Does not meet in the old high-water zone and would only be met in the new high-water zone by employing additional mitigation actions at greater levels because of large group sizes and long trips, as well as erratic launch patterns.	Meets because of low use levels, a reduction in group size and trip length, and evening out launch patterns, which would reduce impacts to vegetation.	Does not meet because the benefits of decreasing group size and trip length and evening out launch patterns offset by increased use in the spring . Impacts could not be reasonably mitigated to minor levels in spring.	Meets because of reduced number of passengers, group sizes, and trip lengths; reduced vegetation impacts from low use in the critical spring season. An increase in the level of mitigation would be needed.	Meets because of reduced group sizes and trip lengths, and preservation of use numbers in spring and summer similar to current conditions. Increased mitigation needed due to higher total number of users.	Does not meet because of the doubling of use in the critical spring season. Impacts could not be reasonably mitigated to minor levels.	Does not meet because of the large group sizes, doubling of user days in the critical spring season and great increase in total use. Impacts could not be reasonably mitigated to minor levels.	Meets because of reduced trip lengths, daily launches, group sizes in the spring; decreased impacts from low use in the spring. Increased mitigation needed due to higher total number of users.

Resource / Management Objectives	Alternatives							
	A	B	C	D	E	F	G	H
Terrestrial Wildlife •Manage river recreational use in a manner that protects native terrestrial wildlife and their habitats, and that preserves wildlife populations by minimizing human-caused wildlife disturbances and habitat alteration.	Meets because of low spring and winter use, low motor use in the spring and low user discretionary time, but an increase in the level of mitigation would be needed.	Meets because of reduction in number of passengers in spring and summer and year round no motor season. Impacts could reasonably be mitigated down to minor with a moderate increase in levels of mitigation.	Does not meet due to doubling of user days and passengers in the spring and tripling of user discretionary time in the spring. Large increase in winter use will increase impacts. Impacts could not be reasonably mitigated to minor levels.	Meets because the reduction in number of passengers, group size and trip length, and preserving low use and eliminating motors in the spring would minimize impacts. A significant but reasonable increase in the level of mitigation would be needed.	Meets due to reduction in group size, trip length, and a more regular launch pattern. Impacts could be reasonably mitigated to minor levels.	Does not meet because of the doubling of use in the spring and huge increase in winter use, high spring user discretionary time, and high motor use in the spring and early summer. Impacts could not be reasonably mitigated to minor.	Does not meet due to significant increases in use numbers in winter and spring. Impacts could not be reasonably mitigated to minor.	Meets because use levels are moderately increased in the spring, motor use is limited to one launch per day, group size is reduced to 24 in the spring and trip lengths are reduced. A reasonable increase in level of mitigation would be necessary
Aquatic Resources •Manage river recreational use in a manner that protects native aquatic organisms, reduces aquatic habitat alteration, and minimizes the spread of exotic species.	Does not meet because impacts caused by crowding and congestion that occurs at attraction sites due to erratic launch patterns, large group sizes and long trip lengths would necessitate excessive tributary and attraction site closures to reduce impacts to minor.	Meets due to the reduction in group size and trip length, no motors year-round, evening out launch patterns, and decreased use in critical spring and summer months. Additional reasonable site restrictions would be needed to reduce impacts to minor.	Does not meet because reductions in group size and trip length would be offset by high increases in total users and user discretionary time. Impacts cannot be reasonably mitigated to a minor level.	Meets due to the reduction in number of passengers, group size and trip length, and preserving low use and elimination of motors in the . An increase in the level of mitigation would be needed.	Meets because the new launch pattern, and group size and trip length reduction will result in fewer people at one time visiting aquatic attractions thereby reducing impacts to aquatic resources. A reasonable increase in mitigation would be necessary.	Does not meet because of the doubling of use in the spring, as well as the high motor use in the spring and early summer. Impacts could not be reasonably mitigated to minor levels.	Does not meet because of the large group sizes, large increase in shoulder season passengers, in conjunction with a doubling of spring user days and the concentration of motor use in the spring and summer. At the levels of proposed use, impacts could not be reasonably mitigated to minor levels.	Meets because use levels are moderately increased in the spring, motor use is limited to one launch per day, group size is reduced to 24 in the spring and trip lengths are reduced. A reasonable increase in level of mitigation would be necessary.

Resource / Management Objectives	Alternatives							
	A	B	C	D	E	F	G	H
Threatened or Endangered Species •Protect all threatened, endangered, sensitive, and candidate species and their habitats from impacts associated with river recreational activities.	Meets because of low spring and winter use, low motor use in the spring and low user discretionary time, but an increase in the level of mitigation would be needed.	Meets because of reduction in number of passengers in spring and summer and year round no motor season. Impacts could reasonably be mitigated down to minor with a moderating increase in levels of mitigation.	Does not meet due to doubling of user days and passengers in the spring and tripling of user discretionary time in the spring. Huge increase in winter use will increase impacts. Impacts could not be reasonably mitigated to minor levels.	Meets because even with increases in user discretionary time, the reduction in number of passengers, group size and trip length, and preserving low use and eliminating motors in the critical spring season would minimize impacts. A substantial but reasonable increase in mitigation would be needed.	Meets due to reduction in group size, trip length, and a more regular launch pattern. Impacts could be reasonably mitigated to minor levels.	Does not meet because of the doubling of use in the spring and huge increase in winter use, high spring user discretionary time, and high motor use in the spring and early summer. Impacts could not be reasonably mitigated to minor.	Does not meet due to significant increases in use numbers in winter and spring. Impacts could not be reasonably mitigated to minor.	Meets because use levels are moderately increased in the spring, motor use is limited to one launch per day, group size is reduced to 24 in the spring and trip lengths are reduced. A reasonable increase in level of mitigation would be necessary
Cultural Resources •Maintain the integrity of all significant cultural resources, with site preservation the optimal condition. If preservation is not possible, slow the rate at which their essential material qualities are lost.	Does not meet due to spikes in visitation, large group sizes and lack of active site management. Effects cannot be reasonably mitigated.	Meets (with reasonable mitigation) by eliminating spikes in use and reducing group size which helps to maintain the integrity of significant cultural resources.	Does not meet due to increase in use, especially during the off-season months. Effects cannot be reasonably mitigated.	Does not meet due to increase in use, especially during the off-season months. Effects cannot be reasonably mitigated	Meets (with reasonable mitigation) by eliminating spikes in use and reducing group size which helps to maintain the integrity of significant cultural resources.	Meets (with reasonable mitigation) by eliminating spikes in use and reducing group size which helps to maintain the integrity of significant cultural resources	Meets (with reasonable mitigation) by eliminating spikes in use and reducing group size which helps to maintain the integrity of significant cultural resources	Meets (with reasonable mitigation) by eliminating spikes in use and reducing group size which helps to maintain the integrity of significant cultural resources
•Provide opportunities for present and future populations to understand, experience, and reflect the human history as evidenced through cultural resources in and near the river corridor; protect these resources from adverse effects from visitation.	Does not meet due to limited interpretation and protection of sensitive resources from unregulated visitation.	Meets (with reasonable mitigation) by reducing group size and providing increased education and interpretation of sensitive cultural resources.	Does not meet due to increase in use, especially during the off-season months. Effects from increased visitation cannot be reasonably mitigated.	Does not meet due to increase in use indicators, especially during the off-season. Fewer yearly passengers. Effects from increased visitation cannot be reasonably mitigated.	Meets (with reasonable mitigation) by reducing group size and providing increased education and interpretation of sensitive cultural resources	Meets (with reasonable mitigation) by reducing group size and providing increased education and interpretation of sensitive cultural resources	Meets (with reasonable mitigation) by reducing group size and providing increased education and interpretation of sensitive cultural resources	Meets (with reasonable mitigation) by reducing group size and providing increased education and interpretation of sensitive cultural resources

Resource / Management Objectives	Alternatives							
	A	B	C	D	E	F	G	H
• Preserve the integrity and condition of cultural resources and provide opportunities for traditional access by neighboring American Indian tribal members.	Does not meet due to lack of preservation of significant resources and lack of identified opportunities for American Indian tribal members to access traditional resources.	Meets (with reasonable mitigation) by reducing the group size and congestion at significant cultural resources and sensitive traditional cultural sites.	Meets (with reasonable mitigation) by reducing the group size and congestion at significant cultural resources and sensitive traditional cultural sites.	Meets (with reasonable mitigation) by reducing the group size and congestion at significant cultural resources and sensitive traditional cultural sites.	Meets (with reasonable mitigation) by reducing the group size and congestion at significant cultural resources and sensitive traditional cultural sites.	Meets (with reasonable mitigation) by reducing the group size and congestion at significant cultural resources and sensitive traditional cultural sites.	Meets (with reasonable mitigation) by reducing the group size and congestion at significant cultural resources and sensitive traditional cultural sites.	Meets (with reasonable mitigation) by reducing the group size and congestion at significant cultural resources and sensitive traditional cultural sites.
Visitor Experience • Provide a diverse range of quality recreational opportunities for visitors to experience and understand the environmental interrelationships, resources, and values of Grand Canyon National Park.	Meets by providing a diverse range of river trip opportunities with a variety of group sizes and trip lengths.	Does not meet due to the elimination of motorized river trip and Whitmore exchange opportunities. Effects cannot be reasonably mitigated.	Does not meet due to the elimination of motorized river trip and Whitmore helicopter exchange opportunities. Effects cannot be reasonably mitigated.	Meets by providing a diverse range of river trip opportunities with a variety of group sizes and trip lengths (although Whitmore helicopter exchange opportunities are eliminated).	Meets by providing a diverse range of river trip opportunities with a variety of group sizes and trip lengths.	Meets by providing a diverse range of river trip opportunities and a variety of group sizes and trip lengths.	Meets by providing a diverse range of river trip opportunities with a variety of group sizes and trip lengths (although eliminates winter commercial river trips and provides the shortest trip lengths of all alternatives).	Meets by providing a diverse range of river trip opportunities with a variety of group sizes for noncommercial trips, a larger group sizes and trip lengths.
• Levels and types of use enhance visitor experience and minimize crowding, conflicts, and resource impacts.	Does not meet due to substantial spikes in use, large group sizes, camp competition, and congestion at popular attraction sites during the summer. Effects cannot be reasonably mitigated.	Meets by setting daily launch limits and reducing group size, camp competition, and congestion at popular attraction sites.	Meets (with reasonable mitigation) by setting daily launch limits and reducing group size, camp competition, and congestion at popular attraction sites.	Meets (with reasonable mitigation) by setting daily launch limits and reducing group size, camp competition, and congestion at popular attraction sites.	Meets (with reasonable mitigation) by setting daily launch limits and reducing group size, camp competition, and congestion at popular attraction sites.	Meets (with reasonable mitigation) by setting daily launch limits and reducing group size, camp competition, and congestion at popular attraction sites.	Meets (with reasonable mitigation) by setting daily launch limits, reducing group size, camp competition, and congestion at popular attraction sites.	Meets (with reasonable mitigation) by setting daily launch limits, reducing group size, camp competition, and congestion at popular attraction sites.

Resource / Management Objectives	Alternatives							
	A	B	C	D	E	F	G	H
•Manage the Colorado River corridor through Grand Canyon National Park to protect and preserve the resource in a wild and primitive condition and provide a wilderness river experience.	Meets (with reasonable mitigation), although to a lesser degree than most action alternatives due to large group sizes, substantial spikes in use, camp competition, and congestion at popular attraction sites during the summer months.	Meets by reducing group sizes, setting daily launch limits, prohibiting Whitmore helicopter exchanges, and providing increased non-motorized opportunities.	Meets (with reasonable mitigation) by reducing group sizes, setting daily launch limits, prohibiting Whitmore helicopter exchanges, and providing increased non-motorized opportunities.	Meets by reducing group sizes, setting daily launch limits, prohibiting Whitmore helicopter exchanges, and providing increased non-motorized opportunities.	Meets by reducing group sizes, setting daily launch limits, restricting the number and timing of Whitmore helicopter exchanges, and providing increased non-motorized opportunities.	Meets (with reasonable mitigation) by reducing group sizes, setting daily launch limits, restricting the number and timing of Whitmore helicopter exchanges, and providing increased non-motorized opportunities (although to a lesser degree during the high use levels in May and June).	Meets (with reasonable mitigation) by reducing group sizes, setting daily launch limits, restricting the number and timing of Whitmore helicopter exchanges, and providing increased non-motorized opportunities (although to a lesser degree than other action alternatives).	Meets by reducing group sizes, setting daily launch limits, restricting the number and timing of Whitmore helicopter exchanges, and providing increased non-motorized opportunities.
Socioeconomic Environment •Provide a diverse range of recreational opportunities while minimizing the impacts of actions to resources, user groups, and park neighbors.	Meets	Meets (with reasonable mitigation to commercial operators.) Impacts to Bar 10 cannot be mitigated.	Meets (with reasonable mitigation to commercial operators). Impacts to Bar 10 cannot be mitigated.	Meets. impacts to Bar 10 cannot be mitigated.	Meets. Impacts to Bar 10 may not be mitigated)	Exceeds. No mitigations required. Increased revenue for all commercial operators)	Meets. No mitigations required.	Exceeds. No mitigations required. Increased revenue for all commercial operators.
Park Operations •Ensure sufficient fiscal and human resources necessary to successfully implement the plan.	Does not meet due to current deficiencies in fiscal and human resources.	Meets (with reasonable mitigation) by reducing use levels	Meets (with reasonable mitigation) by reducing group size, and spreading use throughout the year.	Meets (with reasonable mitigation) by reducing group size, and spreading use throughout the year.	Meets (with reasonable mitigation) by reducing group size, and spreading use throughout the year.	Does not meet due to the substantial shift in use patterns and increased use in spring months.	Does not meet due to large group size and increased year round use.	Meets (with reasonable mitigation) by reducing group size, and spreading use throughout the year.

Resource / Management Objectives	Alternatives							
	A	B	C	D	E	F	G	H
Adjacent Lands •Minimize adverse effects from river management to areas outside of the park.	Does not meet. Spikes in use and large group sizes result in impacts at exchanges, put-ins and take-outs. Effects cannot be reasonably mitigated.	Meets by eliminating spikes in use and reducing group sizes. No mitigation required.	Meets by eliminating spikes in use and reducing group sizes. No mitigation required.	Meets by eliminating spikes in use and reducing group sizes. No mitigation required.	Meets by eliminating spikes in use and reducing group sizes. No mitigation required.	Meets (with reasonable mitigation) by eliminating spikes in use and reducing group sizes.	Meets (with reasonable mitigation) by eliminating spikes in use and reducing group sizes.	Meets (with reasonable mitigation) by eliminating spikes in use and reducing group sizes.
•Minimize adverse effects of adjacent land activities on park resources and river activities.	Meets (no mitigation required)	Meets (no mitigation required)	Meets (no mitigation required)	Meets (no mitigation required)	Meets (no mitigation required)	Meets (no mitigation required)	Meets (no mitigation required)	Meets (no mitigation required)
•Work cooperatively with the Hualapai Tribe and other adjacent land managers on alternatives and implementation of a final *Colorado River Management Plan.*	Meets	Meets (by analyzing range of alternatives)	Meets (by analyzing range of alternatives)	Meets (by analyzing range of alternatives)	Meets (by analyzing range of alternatives)	Meets (by analyzing range of alternatives)	Meets (by analyzing range of alternatives)	Meets (by analyzing range of alternatives)

LOWER GORGE ALTERNATIVES (RM 226 TO RM 277)

The Lower Gorge alternatives relate to the section of the Colorado River from Diamond Creek (RM 226) to Lake Mead (RM 277). Five alternatives that represent the full range of use from low to very high levels have been developed for this river section. These alternatives are independent of the alternatives for the upper river from Lees Ferry to Diamond Creek. It is possible to combine any of the Lower Gorge alternatives with any of the Lees Ferry alternatives.

Recreational use patterns change in this section of the river as a result of differing land management practices and road and boat access to the river by way of the Hualapai Reservation and Lake Mead. The complexities of land management are addressed in more detail in the "Adjacent Lands" section of Chapter 3. For the purpose of developing alternatives, the Hualapai Tribe controls the access and use of lands on the south side of the river above the historic high water line between National Canyon (RM 164) and the Hualapai tribal lands boundary (RM 273). An 18-mile-long unpaved road across Hualapai tribal land provides access from Peach Springs, Arizona, to the mouth of Diamond Creek (RM 226). This road provides the first vehicle access to the river below Lees Ferry; therefore, Diamond Creek is used as a primary takeout point for river trips, especially non-motorized trips. Trips bypassing Diamond Creek must travel an additional 54 miles to the next takeout opportunity at Pearce Ferry (now closed due to low water) or more than 70 miles to South Cove in Lake Mead. Diamond Creek is also a launching point for trips running just the Lower Gorge.

Many of the commercial companies coming downriver from Lees Ferry use the helicopter exchange point on the Hualapai tribal land at Whitmore (RM 187), which allows passengers to end their trip at this point and exit by helicopter. The boats must continue to Diamond Creek or Lake Mead. Boats proceed with or without passengers (deadhead), and some exit the river by way of the Diamond Creek road. However, deadhead trips generally bypass Diamond Creek and takeout at Pearce Ferry (or South Cove at low lake levels). Below Diamond Creek the user-day limits established by Grand Canyon National Park do not currently apply. Some companies use the Whitmore exchange point to not only take passengers out but also to bring new passengers in for a short, three-day trip through the Lower Gorge. After a three-day river trip, these passengers are usually met by a jetboat and taken to South Cove. Other trips, both commercial and private, end at Diamond Creek, and both passengers and boats travel across Hualapai tribal lands. HRR trips and some private trips launch at Diamond Creek to run through the Lower Gorge. Farther down the river, at RM 262, helicopters operating for the Hualapai Tribe carry people to the river for a quick pontoon boat ride and then a helicopter trip out at the same point. HRR trips launching at Diamond Creek also use the helicopters at RM 262 to exit or exchange their passengers, and the boats continue on to Lake Mead. Occasionally, HRR trips bring in new passengers at this location and continue downriver to Lake Mead. Upriver travel from Lake Mead in motorized boats is permitted as far as Separation Canyon. Encounters with other groups and congestion are at their highest levels in the Lower Gorge; for instance, group sizes are higher and pontoon trips can be encountered on both their upriver and downriver course.

To accommodate the use levels from upriver trip takeouts, as well as commercial operations, limited facilities have been installed at the following locations:

Diamond Creek	2 ramadas, a toilet, and an 18-mile unimproved road
Spencer Canyon	1 toilet
RM 259	2 helicopter pads, 4 shade umbrellas
RM260	4 helicopter pads, 2 ramadas
RM262	2 helicopter pads, 1 ramada, 1 fuel storage area, 1 boat mooring facility
RM263	7 helicopter pads, 3 ramadas, 2 toilets, 1 boat mooring facility

The National Park Service's preferred alternative is Alternative 4, and together with the Lees Ferry Alternative H (preferred alternative), these two alternatives represent the combined preferred alternative in this *Draft Environmental Impact Statement*.

CRITERIA FOR DEVELOPING ALTERNATIVES

CARRYING CAPACITY STANDARDS

Use in the Lower Gorge represents an increase in the intensity and variety of use, including multiple places for put-ins and takeouts; trip lengths range from less than 1 hour to several days. Additionally, river traffic is two-directional below Separation Canyon. This complexity and high degree of variety makes setting the number of trips at one time, people at one time, and user discretionary time less useful than in the upper section of the river. At the same time, many standards remain important. The following key standards were used in calculating carrying capacity in the Lower Gorge:

- number, size, distribution, and expected lifespan of camping beaches
- number, types, and condition of natural and cultural resources
- contacts per day (on-river attraction site encounters), campsite competition, group size, trip length, and launch patterns

KEY TRIP VARIABLES

Diamond Creek Launches. The significance of launches per day as a management variable is detailed in the discussion of the Lees Ferry to Diamond Creek key trip variables (see Chapters 3 and 4 for additional discussion). The current condition of two private launches per day is carried throughout each of the alternatives, but launches for HRR day and overnight trips have been set to address carrying capacity in the reaches below Diamond Creek.

Group Size. The significance of group size as a management variable is detailed in the discussion of the Lees Ferry to Diamond Creek key trip variables (see Chapters 3 and 4 for additional discussion). The zones below Diamond Creek are characterized as semi-primitive, recognizing higher use and a greater variety of activities. The size and capacity of camping beaches in the Lower Gorge is diminishing due to erosion, and vegetation encroachment by exotic plant species accounts for much of the loss of areas suitable for camping. Group size affects park resources because larger groups need more space at lunch, camping, and attraction sites. This is another important variable that can be directly prescribed by the National Park Service to achieve management objectives.

Maximum Trip Lengths. The significance of trip length as a management variable is detailed in the discussion of the Lees Ferry to Diamond Creek key trip variables (see Chapters 3 and 4 for additional discussion). Zoning in the Lower Gorge is consistent with shorter trip lengths.

Campsites and Attraction Sites. As described in "Visitor Use and Experience" in Chapter 3, there are fewer campsites in the Lower Gorge, particularly downstream of Separation Canyon. Within the first 14 miles below Diamond Creek there are 15 camps and three popular attraction sites. The number of existing camps, as well as the number of new camps allowed to be created, and the degree of development allowed at these new camps, was a key factor in determining the number of trips launching per day.

Upriver Travel. Boats traveling upriver from Lake Mead and the pontoon boat tours in the Quartermaster area currently add to the mix of recreational use and activity, especially in Zone 3 and upriver as far as Separation Canyon in Zone 2. Upriver travel from Lake Mead is addressed in each alternative by placing limits on the types of upriver travel allowed and the allowable destination. The destinations and type of uses are key to addressing carrying capacity, visitor safety, and the range of opportunities in the Lower Gorge.

ELEMENTS COMMON TO ALL LOWER GORGE ALTERNATIVES

Several elements that are common to all alternatives for the Lower Gorge are summarized below:

HRR Boats — All HRR boats (for day or overnight trips) are assumed to be motorized boats similar to those in current use. These have a passenger capacity of 8 and a crew capacity of 2 (total capacity: 10).

HRR Deadhead trips — HRR trips do not generally "deadhead" boats from Diamond Creek to RM 262 for trips from that point to Lake Mead. The Hualapai Tribe offers exchanges at RM 262, but the practice of having empty boats traveling the first part of the Lower Gorge is inefficient and contributes to congestion in the Lower Gorge.

Spencer Creek Toilet — The existing composting toilet at Spencer Creek will remain in all alternatives, as agreed to with the Hualapai Tribe relative to the Area of Cooperation.

Educational Trips — A distinction will no longer be made between noncommercial and educational special use trips from Diamond Creek to Lake Mead. Educational groups can apply as a noncommercial trip (with a 16-person limit).

Group Size — Group size limits as part of continuation trips will be as defined for the Lees Ferry alternatives (see Table 2-3).

Upriver Travel — No primarily upriver travel will be allowed above Separation Canyon.

Noncommercial Permits — Noncommercial permits for all overnight Lower Gorge use will be available from the park's River Permits Office, and they will be distributed on a first-come, first-served basis.

Operating Requirements for Pontoon Boats — Pontoon boats will be operated in accordance with U.S. Coast Guard regulations for commercial use, which require a 6-

pack license to carry six passengers. A captain's license is required to carry additional passengers.

Permit System — The permit system for noncommercial trips starting at Diamond Creek will be handled by Grand Canyon National Park personnel and will be entirely separate from the permit system for launches at Lees Ferry. The park will provide permit information to the Hualapai Tribe so that they know what to expect and who to contact for their fees. Hualapai River Runners, a Hualapai tribal enterprise, runs the only commercial operation that launches at Diamond Creek.

Concession Contract — Subject to compliance with 36 CFR Part 51 Subpart D, the National Park Service intends to award the Hualapai Indian Tribe a temporary noncompetitive concession contract for a term not to exceed three years for its Lower Gorge operations as described in the final river management plan and the record of decision for this environmental impact statement.

ALTERNATIVE 1: NO ACTION (CURRENT CONDITIONS)

Alternative1 is the no-action alternative for the section of river between Diamond Creek and Lake Mead, and existing operations and current conditions would continue. Use in this area is characterized by upriver trip takeouts, including jetboats (with use varying between the primary and shoulder seasons); HRR day trips (primary season is March – October) and occasional overnight trips; upriver continuation trips; noncommercial trips launching at Diamond Creek; and pontoon boat excursions in the Quartermaster area (about RM 262), which are operated by Oriental Tours Incorporated (OTI) under contract with the Hualapai Tribe. Launch and takeout congestion occurs at Diamond Creek primarily during the high-use summer months. Occasionally, flash floods on the Diamond Creek road make launches and takeouts impossible. Passengers for the pontoon boat excursions and the HRR trips enter and exit the river corridor by means of helicopters, with helipads in the Quartermaster area. In addition to the downriver traffic, riverboat takeout shuttles and recreational users from Lake Mead make periodic journeys into the lower gorge of the Grand Canyon. Based on agreements between the National Park Service and the Hualapai Tribe in 2000, a moratorium was placed on recreational use levels occurring at that time.

WHAT THIS ALTERNATIVE ACCOMPLISHES

Carrying Capacity Standards

- Current operations would be continued. Recreational use would not be limited except noncommercial launches from Diamond Creek (two per day for a maximum of 16 people each).
- The number of pontoon boats in the Quartermaster area would be maintained at five.
- The number of pontoon passengers would be maintained at current levels.
- The current 15 campsites would be maintained in nonmanipulated areas.

Peak Season Overall Use

- Current operations would be continued (for continuation trips, HRR day/overnight trips, and pontoon boat trips).
- Launches per day from Diamond Creek would include two noncommercial and one HRR day trip, plus occasional HRR overnight trips.
- Overall use would continue current operations, including jetboat commercial passenger pickups and tow-outs from Lake Mead.

KEY TRIP VARIABLES

Diamond Creek Launches (number per day)

- HRR day trips would continue to average one launch per day in the peak season, with a maximum of 10 boats launching at the same time; there would be no annual limit on the number of trips.
- HRR overnight trips would average three per month, with no annual limit on the number of trips. Trips are generally for two days and one night.
- Noncommercial river trips would be limited to two launches per day. About 100 noncommercial overnight, educational, or administrative trips launch from Diamond Creek annually.

Group Sizes (in numbers of people)

- HRR day trips would be limited to one per day, with a maximum capacity of 80 passengers and 20 crew members per day (each of the 10 boats accommodates a maximum of 8 passengers and 2 crew members); trip sizes vary from a low of 2 passengers to a high of 89 passengers on any given day. Overnight trips generally consist of three boats with a total 28 passengers and up to 6 crew members (34 people total).

- Noncommercial trips would be limited to 16 people (32 people total per day).
- Groups sizes for continuation trips would be consistent with current upriver operations for both commercial and noncommercial trips.

Trip Lengths (in number of days)

- There would be no restrictions on the number of days for trips.

Campsites

- There are no developed campsites.
- Camps would be available on a first-come basis; there would be no limit on the number of nights that trip participants could camp in the Lower Gorge.
- There would be no scheduling of campsites.

Upriver Travel

- There would be no limits on the number of boats traveling upriver from Lake Mead.
- Upriver travel would be restricted to the river section below Separation Canyon.

OTHER ISSUES

Helicopter Use

- Helicopter use associated with river use would be limited to HRR exchanges and pontoon trips in the Quartermaster area. Helicopter operations in the Quartermaster area take off and land on sovereign tribal land; thus, the National Park Service does not regulate helicopter operations in this area.

Exchanges

- There would be no limits on the number of exchanges. Exchanges would be restricted to the helipads in the Quartermaster area.

Pontoon Use and Associated Facilities

- Five pontoon boats (21–24 feet long) would continue to take visitors on a 20-minute boat tour, with a maximum of 10 passengers per boat at one time. There would be no limits on the number of pontoon boats on the water at one time.
- Passenger use varies widely, from no use to a maximum of 377 passengers a day. From May through September use averages 188 passengers per day; on a year-round basis use averages 160 passengers a day. When use levels were frozen as part of the Core Team agreement in 2000, the yearly passenger total was 22,670.
- In 2003 a total of 56,562 passengers were reported, with a daily average of 160 passengers over the course of the year, and 188 from May through September. Daily passenger numbers vary widely, from none to 300+ passengers per day.
- Two small floating docks at RM 262 and RM 263 would be continued for passenger loading and unloading (see previous listing for facilities available).
- Access and egress for all pontoon boat passengers would continue by helicopter.

SUMMARY OF USE — ALTERNATIVE 1 (NO ACTION)

Diamond Creek Launches (Group Size, Including Guides)				Pontoon Trips* (Average Daily Passengers)		
Noncommercial Trips	HRR Day Trips	HRR Overnight Trips	Available Campsites	Peak Season	Year-round	Upriver Travel from Lake Mead
Maximum of two trips per day (16 people each)	Average of one trip per day (up to 100 people)	Average of three trips per month (34 people)	15	188**	160	Allowed (un-limited below Separation Canyon)

* Passenger access and egress is by helicopter.
**Daily passenger numbers vary widely, occasionally surpassing 350/day

ALTERNATIVE 2

Alternative 2 is characterized by the implementation of daily passenger limits launching from Diamond Creed and by the elimination of pontoon boat operations and associated facilities in the Quartermaster area. Upriver trip takeouts would be allowed based on continuation trip needs; HRR day trips would be restricted during the peak season to two trips of 30 people per day (for a maximum of 60 people, including guides), and during the rest of the year to one trip per day (maximum of 30 people including guides). HRR overnight trips would be restricted to one trip per day of 30 people (including guides) year-round. The number of boats allowed to travel upriver as far as RM 262 would be decreased to two per day.

WHAT THIS ALTERNATIVE ACCOMPLISHES

Carrying Capacity Standards

- Current operations would be reduced by decreasing group size for HRR day trips from one trip of up to 100 people per day to two launches of 30 people per day (for a maximum of 60 people, including guides). HRR overnight trips would be increased to one launch per day (up from three per month), with a maximum group size of 30, down from an average of 34 people per trip (including guides). Two noncommercial launches per day would be allowed (16 people each), the same as Alternative 1.
- The current pontoon boat operation and associated facilities in the Quartermaster area would be eliminated.
- One additional campsite would be created, contingent on environmental compliance, primarily for HRR overnight trips. Resource manipulation of the area would be restricted to removal of vegetation only. The 15 existing campsites would not be changed.

Peak Season Overall Use

- The number of recreational passengers per day would be reduced and would be comprised only of continuation trips, along with HRR day / overnight and noncommercial launches from Diamond Creek. Yearly passenger totals for HRR could increase.
- Daily launches from Diamond Creek during the peak season would include two HRR day trips and one HRR overnight trip; noncommercial launches (two per day) would be the same as Alternative 1.

KEY TRIP VARIABLES

Diamond Creek Launches (maximum number per day)

- HRR day trips would be limited to two launches per day in the peak season and one launch per day in the non-peak season.
- HRR overnight trips would be limited to one launch per day year-round.
- The maximum number of noncommercial launches would remain at two per day.

Maximum Group Sizes (in numbers of people)

- Each HRR day and overnight trip would be limited to 30 people (including guides).
- Noncommercial trips would remain at 16 people.

Maximum Trip Lengths (in number of days)

- During the peak season trips would be limited to four nights (one night between Diamond Creek and Separation Canyon, one night between Separation Canyon and RM 260, and two nights between RM 260 and RM 277).

- During the non-peak season trips would be limited to five nights (one night between Diamond Creek and Separation Canyon, two nights between Separation Canyon and RM 260, and two nights between RM 260 and RM 277).

Campsites

- One new campsite would be developed for HRR use (below Separation Canyon), with a low level of resource manipulation (vegetation removal only).

Upriver Travel

- Motorized tow-outs would be allowed below RM 262.
- Commercial pick-ups would be limited to two per day during the peak season.
- No commercial pick-ups would be allowed during the non-peak season.
- No jetboat tours would be allowed.

OTHER ISSUES

Helicopter Use

- Helicopter use associated with river use would be limited to HRR exchanges in the Quartermaster area. Because pontoon trips would be eliminated, associated helicopter use would be eliminated as well. Helicopter operations in the Quartermaster area take off and land on sovereign tribal land; thus, the National Park Service does not regulate helicopter operations in this area.

Lunch Stops

- Trips could not combine lunch stops due to the limited physical capacity of nearshore areas.

Pontoon Use and Associated Facilities

- Pontoon use and associated facilities would be eliminated under this alternative.

SUMMARY OF USE — ALTERNATIVE 2

Diamond Creek Launches (Maximum Group Size, Including Guides)			Available Campsites	Pontoon Trips (Average Daily Passengers)		Upriver Travel from Lake Mead
Noncommercial Trips	HRR Day Trips	HRR Overnight Trips		Peak Season	Year-round	
Maximum of two trips per day (16 people each)	Peak season: two trips per day (30 people each) Non-peak season: one trip per day (30 people)	One trip per day (30 people)	15+1*	0	0	Commercial pick-ups: peak season — two per day; non-peak season — none. Tow-outs allowed below RM 262.

* Allows for vegetation removal to develop one 1 HRR campsite on river left.

ALTERNATIVE 3

Alternative 3 is characterized by the implementation of daily passenger limits for HRR (up to 150 people per day in the peak season) and pontoon boat operations (up to 400 people per day). Peak daily use for HRR day trips would be reduced from 100 to 90 people per day (including crew), while HRR overnight trips would go from an average of three trips per month to two trips per day year-round, with a daily maximum of 60 people (including crew). Pontoon operations would continue in the Quartermaster area with five boats, with daily passenger totals up to 400. Takeouts for upriver trips would be allowed based on takeout needs for continuation trips. An additional commercial use — jetboat tours — would be allowed, with a maximum of two tours per day. A floating, formal dock would be provided at RM 262.5, contingent on environmental compliance and the removal of the informal docks at RM 262 and 263. The dock would be sized to allow mooring of three pontoon boats and HRR downriver boats while unloading and loading passengers.

WHAT THIS ALTERNATIVE ACCOMPLISHES

Carrying Capacity Standards

- Overall operations would be increased while reducing group size for all HRR trips (both day and overnight).
- Five pontoon boats would be maintained in the Quartermaster area.
- The number of pontoon passengers would be capped at 400 per day, an increase from the current daily average.
- Two additional campsites would be created, contingent on environmental compliance, primarily for HRR overnight trip use; resource manipulation would be restricted to vegetation removal and limited supply storage. The 15 existing campsites for other users would not be changed.

Peak Season Overall Use

- The number of recreational passengers per day would be increased, including continuation trips, HRR day / overnight trips and noncommercial trips launching from Diamond Creek, and pontoon boat excursions. Yearly passenger totals for HRR could increase.
- Trips launching from Diamond Creek would include three HRR day trips and two HRR overnight during peak season; two noncommercial launches per day would be allowed, the same as Alternative 1.
- Two upriver jetboat tours per day would be allowed.

KEY TRIP VARIABLES

Diamond Creek Launches (maximum number per day)

- HRR day trips would be limited to three launches per day in the peak season and two launches in the non-peak season.
- HRR overnight trips would be limited to two launches per day year-round.
- The maximum number of noncommercial daily launches would remain at two.

Maximum Group Sizes (number of people)

- HRR day and overnight trips would be limited to 30 people each (including guides).
- Noncommercial trips would remain at 16 people.
- Group sizes for jetboat tours would be subject to legal carrying capacity standards of the craft, but no more than 36.

Maximum Trip Lengths (in number of days)

- During the peak season trips would be limited to five nights (one night between Diamond Creek and Separation Canyon, two nights between Separation Canyon and RM 260, and two nights between RM 260 and RM 277).
- During the non-peak season trips would be limited to eight nights (two nights between Diamond Creek and Separation Canyon, three nights between Separation Canyon and RM 260, and three nights between RM 260 and RM 277).

Campsites

- Two new campsites for HRR use would be developed below Separation Canyon, allowing a medium level of development (vegetation removal and limited supply storage).
- The total number of other campsites would remain unchanged.

Upriver Travel

- Motorized tow-outs would be allowed below Separation Canyon.
- Commercial pick-ups would be limited to four per day year-round.
- Commercial pick-ups would be allowed to shuttle kayak trips upstream, dropping them off at RM 273.
- Jetboat tours would be limited to two per day during the peak season only.

OTHER ISSUES

Helicopter Use

- Helicopter use associated with river use would be limited to HRR exchanges and pontoon passenger access/egress in the Quartermaster area. Helicopter operations in the Quartermaster area take off and land on sovereign tribal land; thus, the National Park Service does not regulate helicopter operations in this area.

Lunch Stops

- Trips could not combine lunch stops due to the limited physical capacity of nearshore areas.

Pontoon Use

- There would be a maximum of five boats in the Quartermaster area.
- A maximum of five boats (with a maximum of 10 passengers per boat) could operate at one time.
- The maximum number of passengers would be 400 per day.
- Existing docking facilities would be removed, and a formal dock would be constructed at RM 262.5, contingent on environmental compliance.

SUMMARY OF USE — ALTERNATIVE 3

Diamond Creek Launches (Group Size Including Guides)			Available Campsites	Pontoon Trips* (Maximum Daily Passengers)	Upriver Travel from Lake Mead
Noncommercial Trips	HRR Day Trips	HRR Overnight Trips			
Maximum of two trips per day (16 people each)	Peak season: three trips per day (30 people each) Non-peak season: two trips per day (30 people)	Two trips per day (30 people)	15+2**	400	Four commercial pick-ups per day, year-round.*** Two jetboat tours per day in the peak season. Tow-outs allowed below Separation Canyon.

* Passenger access and egress by means of helicopter.
** Allows for vegetation removal to develop two HRR campsites with limited supply storage on river left.
*** Commercial pick-ups would be allowed to shuttle kayak trips up to RM 273.

ALTERNATIVE 4

Alternative 4 is characterized by a redistribution of HRR operations and represents a consensus between Grand Canyon National Park and the Hualapai Tribe on levels of HRR use and other uses originating at Diamond Creek. This alternative, however, presents the National Park Service's preference for lower levels of pontoon boat use in the Quartermaster area compared to current average use. HRR daily passenger totals during the peak season would be limited to 96, with group sizes (including guides) not to exceed 40. No limits would be placed on trips per day in the peak season. This would offer HRR managers increased flexibility in scheduling launches, while encouraging booking of smaller trips. Two trips of 35 people (including guides) would be permitted daily during the non-peak season. For HRR overnight trips, three trips per day of 20 people (including guides) would be allowed in the peak season, and one trip of 20 people (including guides) in the non-peak season. Pontoon operations would continue with five boats in the Quartermaster area, with a maximum daily capacity of 150 passengers. Upriver trip takeouts would be allowed based on continuation trip needs. A floating, formal dock would be allowed at RM 262.5, contingent on environmental compliance and removal of the "informal" docks at RM 262 and 263. The dock would accommodate five pontoon boats and two HRR downriver boats while loading and unloading.

WHAT THIS ALTERNATIVE ACCOMPLISHES

Carrying Capacity Standards

- Overall HRR operations would be increased, while reducing group size for all HRR trips (both day and overnight trips).
- The number of pontoon boats in the Quartermaster area would be maintained at five.
- The number of pontoon passengers would be capped at 150 per day.
- Three additional campsites would be created, contingent on environmental compliance, primarily for the use by HRR overnight trips. Manipulation of the area would be restricted to the removal of vegetation. The 15 existing campsites would not be changed.

Peak Season Overall Use

- Recreational passengers per day would be distributed throughout the year, thereby eliminating the peak use pattern. Lower use levels would be identified for non-summer periods, recognizing some increased use during the summer season. Pontoon boat use would remain constant throughout the year. Yearly HRR passenger totals would have the potential to increase.
- Three HRR overnight trips and a variable number of HRR day trips (with a total passenger cap of 96) would be allowed to launch daily from Diamond Creek; noncommercial launches would remain the same as the no-action alternative (two launches per day with a maximum of 16 people each).

KEY TRIP VARIABLES

Diamond Creek Launches (number per day)

- HRR day trips would be unlimited during the peak season (aside from group size and daily passenger limits) and limited to two launches per day (of up to four boats) during the non-peak season.
- HRR overnight trips would be limited to three launches per day in the peak season and one launch per day in the non-peak season
- The maximum number of noncommercial daily launches would remain at two.

Maximum Group Sizes (in numbers of people)

- HRR day trips would be limited to 40 people (including guides) in the peak season and 35 in the non-peak season.
- HRR overnight trips would be limited to 20 people (including guides) year-round.
- Noncommercial trip group sizes would remain at 16 people per trip.

Maximum Trip Lengths (in number of days)

- During the peak season trips would be limited to three nights (one night between Diamond Creek and Separation Canyon, one night between Separation Canyon and RM 260, and one night between RM 260 and RM 277).
- During the non-peak season trips would be limited to five nights (one night between Diamond Creek and Separation Canyon, two nights between Separation Canyon and RM 260, and two nights between RM 260 and RM 277).

Campsites

- Three new campsites could be developed for HRR use (below Separation Canyon), with a low level of development (vegetation removal only).

Upriver Travel

- Motorized tow-outs would be allowed below RM 260; however, if Lake Mead levels are high enough, tow-outs would be allowed at Separation Canyon (RM 240).
- Commercial pick-ups would be limited to four per day during the peak season and one per day during the non-peak season.
- No jetboat tours would be allowed.

OTHER ISSUES

Helicopter Use

- Helicopter use associated with river trips would be limited to HRR exchanges and pontoon passenger access/egress in the Quartermaster area. Helicopter operations in the Quartermaster area take off and land on sovereign tribal land; thus, the National Park Service does not regulate helicopter operations in this area.

Lunch Stops

- Trips could not combine lunch stops due to the limited physical capacity of nearshore areas.

Pontoon Use

- There could be a maximum of six pontoon boats in the Quartermaster area.
- A maximum of five boats could operate at one time.
- There would be a maximum of 150 passengers per day.
- A formal dock, sized to minimally accommodate HRR and pontoon use, would be built at RM 262.5, contingent on environmental compliance and removal of existing docks.

SUMMARY OF USE — ALTERNATIVE 4

Diamond Creek Launches (Maximum Group Size, Including Guides)			Available Campsites	Pontoon Trips* (Maximum Daily Passengers)	Upriver Travel from Lake Mead
Noncommercial Trips	HRR Day Trips	HRR Overnight Trips			
Maximum of two trips per day (16 people each)	Peak season: variable (40 people per trip) Non-peak season: two trips per day (35 people)	Peak season: three trips per day (20 people per trip) Non-peak season: one trip per day (20 people)	15+3**	150	Commercial pick-ups: peak season — four per day; non-peak season — one per day. Tow-outs allowed below RM 260 unless Lake Mead at full pool, then below Separation Canyon.

* Passenger access and egress by means of helicopter.

** Allows for vegetation removal only to develop three HRR campsites on river left.

ALTERNATIVE 5: HUALAPAI TRIBE PROPOSED ACTION

Alternative 5 is characterized by a redistribution of HRR operations and represents a consensus between Grand Canyon National Park and the Hualapai Tribe on levels of HRR use and other uses originating at Diamond Creek. This alternative, however, presents the Hualapai Tribe's proposed higher levels of pontoon boat use in the Quartermaster area compared to current average use. HRR daily passenger totals during the peak season would be limited to 96, with a maximum group size of 40 people (including guides). No limits would be placed on trips per day in the peak season, offering HRR managers increased flexibility in scheduling launches, while encouraging the booking of smaller trips. Two trips of 35 passengers (including guides) would be permitted daily during the non-peak season. For HRR overnight trips, three trips per day of 20 people (including guides) would be allowed during the peak season, and one trip of 20 people (including guides) during non-peak season. Pontoon operations would be expanded, with a maximum of seven boats in the Quartermaster area and a maximum daily capacity of 960 passengers. Upriver trip tow-outs would be allowed based on continuation trip takeout needs. A floating, formal dock (sized to accommodate seven pontoon boats and two HRR boats) would be allowed at RM 262.5, contingent on environmental compliance and the removal of the "informal" docks at RM 262 and 263. All upriver travel, with the exception of upriver pontoon traffic, would be prohibited above RM 273.

WHAT THIS ALTERNATIVE ACCOMPLISHES

Carrying Capacity Standards:

- Overall HRR operations would be increased; however, group sizes would be reduced.
- The current number of pontoon boats in the Quartermaster area would be increased to seven.
- The maximum number of pontoon passengers would be increased to 960 per day.
- Three campsites would be created, contingent on environmental compliance, primarily for the use of HRR overnight trips. Manipulation of the area would be restricted to removal of vegetation. The 15 existing campsites would not be changed.

Peak Season Overall Use

- HRR use would increase during the peak season. Pontoon boat use would remain constant throughout the year. Yearly passenger totals for HRR could increase.
- Three HRR overnight trips and a variable number of HRR day trips (with a total passenger cap of 96) would be allowed to launch daily from Diamond Creek; allowable noncommercial launches would remain the same as the no-action alternative (two launches per day).

KEY TRIP VARIABLES

Diamond Creek Launches (maximum per day)

- HRR day trips would be unlimited during the peak season (aside from group size and daily passenger limits) and limited to two launches per day (of up to four boats) during the non-peak season.
- HRR overnight trips would be limited to three launches per day in the peak season and one launch per day in the non-peak season.
- The maximum number of noncommercial daily launches would remain at two.

Maximum Group Sizes (number per day)

- HRR day trips would be limited to 40 people (including guides) in the peak season and 35 in the non-peak season
- HRR overnight trips would be limited to 20 people (including guides) year-round.

- Noncommercial trip group sizes remain at 16 people.

Maximum Trip Lengths

- During the peak season trips would be limited to three nights (one night between Diamond Creek and Separation Canyon, one night between Separation Canyon and RM 260, and one night between RM 260 and RM 277).
- During the non-peak season trips would be limited to five nights (one night between Diamond Creek and Separation Canyon, two nights between Separation Canyon and RM 260, and two nights between RM 260 and RM 277).

Campsites

- Three new campsite could be developed for HRR use (below Separation Canyon), with a low level of development (vegetation removal only).

Upriver Travel

- Upriver travel would be prohibited above RM 273. Commercial pickups (jetboat) and noncommercial tow-outs would be allowed below RM 273.

OTHER ISSUES

Helicopter Use

- Helicopter use associated with river use would be limited to HRR exchanges and pontoon passenger access/egress in the Quartermaster area. Helicopter operations in the Quartermaster area take off and land on sovereign tribal land; thus, the National Park Service does not regulate helicopter operations in this area.

Lunch Stops

- Trips could not combine lunch stops due to the limited physical capacity of nearshore areas.

Pontoon Use

- There would be a maximum of 7 boats in the Quartermaster area.
- A maximum of 6 boats could operate at one time.
- There would be a maximum of 960 passengers per day.
- A formal dock would be constructed at RM 262.5, contingent on environmental compliance and removal of existing docking facilities.

SUMMARY OF USE — ALTERNATIVE 5

Diamond Creek Launches (Maximum Group Size, Including Guides)				Pontoon Trips:	
Noncommercial Trips	HRR Day Trips	HRR Overnight Trips	Available Campsites	Maximum Daily Passengers*	Upriver Travel from Lake Mead
Maximum of two trips per day (16 people each)	Peak season: variable (40 people per trip) Non-peak season: two trips per day (35 people)	Peak season: three trips per day (20 people per trip) Non-peak season: one trip per day (20 people)	15+3**	960	Upriver travel prohibited above RM 273 Commercial pickups (jetboat) and noncommercial tow-outs allowed below RM 273.

* Passenger access and egress by means of helicopter.
** Allows for vegetation removal only to develop three HRR campsites on river left.

SUMMARY OF THE LOWER GORGE ALTERNATIVES

TABLE 2-6: COMPARISON OF ALTERNATIVES — LOWER GORGE

	Alternatives				
	1	2	3	4	5
Diamond Creek Launches (maximum group size, including guides)					
Noncommercial	Maximum of two launches per day (16 people each)	Same as alternative 1.	Same as alternative 1.	Same as alternative 1.	Same as alternative 1.
HRR Day Trips	Average of one launch per day (up to 100 people)	Peak season: two launches per day (30 people). Non-peak season: one launch per day (30 people)	Peak season: three launches per day (30 people). Non-peak season: two launches per day (30 people)	Peak season: variable (40 people), not to exceed 96 passengers per day. Non-peak season: two launches per day (35 people)	Same as alternative 4.
HRR Overnight Trips	Average of one trip per week (34 people)	One trip per day (30 people)	Two trips per day (30 people)	Peak season: three trips per day (20 people). Non-peak season: one trip per day (20 people)	Same as alternative 4.
Campsites					
Available Campsites	15	15+1	15+2	15+3	15+3
Modification of New Campsites*	N/A	Low	Medium	Low	Low
Quartermaster Area Dock					
Type of Dock	Two small floating docks (deteriorated)	None.	One small floating dock.**	Same as alternative 3.**	One large floating dock.**
Pontoon Operations					
Maximum Daily Passengers†	Peak season: 188 Non-peak season: 160	0	400	150	960
Upriver Travel from Lake Mead					
Allowable Destination	Unlimited below Separation Canyon.	Below RM 262.	Below Separation Canyon.	Below RM 260, unless Lake Mead at full pool, then tow-outs below Separation Canyon.	Below RM 273.
Allowable Use	Unrestricted commercial pick-ups, tow-outs, and non-commercial jetboats	Commercial pick-ups: peak season — two per day; non-peak season — none. Tow-outs allowed below RM 262.	Four commercial pick-ups per day, year-round. ‡ Two jetboat tours per day in the peak season. Tow-outs allowed below Separation Canyon.	Commercial pick-ups: peak season — four per day; non-peak season — one per day. Tow-outs below RM 260.	Jetboat pick-ups and tow-outs below RM 273.

* Low — vegetation removal only; medium — vegetation removal and limited supply storage.

** Assumes removal of existing docks and installation of a single dock at RM 262.5, contingent on full environmental compliance.

† Passenger access and egress occurs via helicopter.

‡ Commercial pickups would be allowed to shuttle kayak trips up to RM 273.

TABLE 2-7: SUMMARY COMPARISON OF ENVIRONMENTAL IMPACTS — LOWER GORGE ALTERNATIVES

NOTE: No natural or cultural resources would be impaired as a result of alternatives considered in this *Draft Environmental Impact Statement.*

Impact Topic	Alternatives				
	1	2	3	4	5
Natural Resources					
•Soils	Adverse, localized to regional, short- to long-term, year-round, moderate to major effects.	adverse, localized to regional, short- to long-term, year-round, minor to moderate effects.	adverse, localized to regional, short- to long-term, year-round, minor to moderate effects.	adverse, localized to regional, short- to long-term, year-round, minor to moderate effects.	adverse, localized to regional, short- to long-term, year-round, moderate to major effects
•Water Quality	Adverse, localized, short-term, year-round, minor to major effects.	Adverse, localized, short-term, year-round, minor effects.	Adverse, localized, short-term, year-round, minor to major effects.	Adverse, localized, short-term, year-round, minor to major effects.	Adverse, localized, short-term, year-round, minor to major effects.
•Air Quality	Adverse, negligible to moderate, regional effects on human health; and adverse, negligible to minor, contributions to major, local to regional, short-term, effects on air quality related resources.	Moderate beneficial effects to regional adverse impacts on human health; and beneficial, negligible to major reductions in contributions to major, regional, effects on air quality related resources.	Minor beneficial effects to regional adverse impacts on human health; and adverse, negligible, increased contributions to major, local to regional effects on air quality related resources.	Minor beneficial effects to regional adverse effects on human health; and beneficial, negligible reduced contributions to major, regional effects on air quality related resources.	Negligible adverse effects to , regional adverse effects on human health; and beneficial, negligible reduced contributions to major, local to regional effects on air quality related resources.
•Natural Soundscape	In zone 3 adverse, short- to long-term, major impacts. In zone 2 adverse, short-term, moderate to major impacts.	In zone 3 adverse, short- to long-term, major impacts. In zone 2 adverse, short-term, moderate to major impacts.	In zone 3 adverse, short- to long-term, major impacts. In zone 2 adverse, short-term, major impacts.	In zone 3 adverse, short- to long-term, major impacts. In zone 2 adverse, short-term, moderate to major impacts.	In zone 3 adverse, short- to long-term, major impacts. In zone 2 adverse, short-term, moderate to major impacts.
•Caves and Paleontological Resources	Adverse, localized, year-round, long-term, minor to major effects.	Adverse, localized, year-round, long-term, negligible to moderate effects.	Adverse, localized, year-round, long-term, negligible to moderate effects.	Adverse, localized, year-round, long-term, negligible to moderate effects.	Adverse, localized, year-round, long-term, negligible to moderate effects.
•Vegetation	Adverse, localized, short- to long-term, seasonal to year-round, moderate to major effects.	Adverse, localized, short- to long-term, seasonal to year-round, minor to moderate effects.	Adverse, localized, short- to long-term, seasonal to year-round, moderate effects.	Adverse, localized, short- to long-term, seasonal to year-round, moderate effects.	Adverse, localized, short- to long-term, seasonal to year-round, moderate effects.
•Terrestrial Wildlife	Adverse, regional and local, short- and long-term, major effects.	Adverse, regional and local, short- and long-term, minor to major effects.	Adverse, regional and local, short- and long-term, minor to major effects.	Adverse, regional and local, short- and long-term, moderate to major effects.	Adverse, regional and local, short- and long-term, minor to major effects.
•Aquatic Resources	Adverse, regional to localized, short- to long-term, seasonal to year-round, and minor to major effects.	Adverse, regional to localized, short- to long-term, seasonal to year-round, and negligible to minor effects.	Adverse, regional to localized, short- to long-term, seasonal to year-round, and minor to moderate effects.	Adverse, regional to localized, short- to long-term, seasonal to year-round, and negligible to moderate effects.	Adverse, regional to localized, short- to long-term, seasonal to year-round, and moderate effects.
•Threatened, Endangered, and Sensitive Species	Adverse, regional and local, seasonal to year-round, short- and long-term, negligible to major effects.	Adverse, regional and local, seasonal to year-round, short- and long-term, negligible to major effects.	Adverse, regional and local, seasonal to year-round, short- and long-term, negligible to major effects.	Adverse, regional and local, seasonal to year-round, short- and long-term, negligible to major effects.	Adverse, regional and local, seasonal to year-round, short- and long-term, negligible to major effects.

Impact Topic	Alternatives				
	1	2	3	4	5
Cultural Resources	Adverse, localized, year-round, long-term, minor to major effects.	Adverse, localized, year-round, long-term, negligible to moderate effects.	Adverse, localized, year-round, long-term, negligible to moderate effects.	Adverse, localized, year-round, long-term, negligible to moderate effects.	Adverse, localized, year-round, long-term, negligible to moderate effects.
Visitor Experience	Adverse, localized to regional, short- to long-term, negligible to major impacts for some users, with beneficial, localized to regional, short- to long-term, negligible to moderate impacts for others.	Adverse, localized to regional, short- to long-term, negligible to moderate impacts for some users, with beneficial, localized to regional, short-to long-term, negligible to major impacts for others.	Adverse, localized to regional, short- to long-term, negligible to major impacts for some users, with beneficial, localized to regional, short- to long-term, minor to moderate impacts for others.	Adverse, localized to regional, short- to long-term, minor to major impacts for some users, with beneficial, localized to regional, short-to long-term, minor to major impacts for others.	Adverse, localized to regional, short- to long-term, minor to major impacts for some users, with beneficial, localized to regional, short- to long-term, minor to major impacts for others.
Socioeconomic Resources	Long-term, localized, negligible impact.	Beneficial, localized, long-term, major impact on Hualapai tribal revenues.	Beneficial, localized, long-term, major impact on Hualapai tribal revenues.	Beneficial, localized, long-term, major impact on Hualapai tribal revenues.	Beneficial, localized, long-term, major impact on Hualapai tribal revenues.
Park Management and Operations	Adverse, localized and regional, short-term negligible to long-term, major effects. Beneficial effects with additional funding and staff.	Adverse, regional, short-term major effects on park patrol operations. Beneficial, localized and regional, long-term moderate effects related to visitor safety and resource management.	Adverse, localized and regional, short- to long-term, major effects.	Adverse, localized and regional, short-term major to long-term, moderate effects on park management and operations. Beneficial, localized, long-term moderate effects on visitor safety and resource management.	Adverse, localized and regional, short-term major to long-term moderate effects.
Adjacent Lands	Negligible.	Negligible.	Negligible.	Negligible.	Negligible.

TABLE 2-8: HOW WELL THE ALTERNATIVES MEET COLORADO RIVER MANAGEMENT PLAN MANAGEMENT OBJECTIVES — LOWER GORGE ALTERNATIVES

Resource / Management Objectives	Alternatives				
	1	2	3	4	5
Soils •Preserve and protect natural soil conditions by minimizing impacts to soils from river recreational activities.	Does not meet because of uncontrolled use, large group sizes, and high numbers of users. Impacts could not be reasonably mitigated to minor levels.	Meets because reduced group sizes, reduced trip lengths, no pontoon boat use and reduced number of jet boats would reduce impacts to soils. Increased mitigation would be needed to reduce impacts to minor.	Meets because reducing group size and trip length, regulating upriver use, and building a dock, will reduce impacts to soils. Mitigation measures would be extensive and need to be employed at increased levels to reduce impacts to minor.	Meets because reducing group size, trip length, number of passengers, number of fuel storage areas, and regulating upriver use, as well as building a dock, would reduce impacts to soils. Increased mitigation measures would be needed to reduce impacts to minor.	Does not meet because of the significant increase in number of passengers, fuel storage areas, and helicopter use, which offsets the benefits of a reduction in upriver use and a dock. Impacts could not be reasonably mitigated to minor levels.
Water Quality •Manage river recreation use in a manner that minimizes adverse chemical, physical, and biological changes to the water quality in the main stem of the Colorado River and its tributaries, seeps, and springs.	Due to fuel storage hazards, large groups, unlimited trip lengths, and unregulated use, this alternative does not meet the management objective	With reasonable mitigation, this alternative meets the management objective by reducing group size and trip length, eliminating fuel storage, and regulating use	With reasonable mitigation, this alternative meets the management objective by regulating use and reducing group size and trip length	With reasonable mitigation, this alternative meets the management objective by regulating use and reducing trip length and group size	With reasonable mitigation, this alternative meets the management objective by regulating use and reducing groups size and trip length
Air Quality •Manage river recreational use to ensure that exhaust emissions from river recreation related vessels do not degrade ambient air quality or adversely affect air quality related values.	Meets for all pollutants except CO.	Meets for all pollutants.	Meets for all pollutants except for CO	Meets for all pollutants except for CO	Meets for all pollutants except for CO
Natural Soundscape •Manage river recreational use in a manner that is consistent with the management zoning while minimizing the adverse effects of human caused noise impacts to the natural soundscape or natural quiet.	Does not meet in Zone 3 even with mitigation due to almost continuous noise in Quartermaster area and >25% audibility in other areas. Meets in Zone 2 with enough mitigation.	Does not meet in Zone 3, even with mitigation and even though noise would be reduced compared to Alt. 1, due to >25% audibility in Quartermaster area and other areas. Meets in Zone 2 with mitigation, reduces noise compared to Alt. 1.	Does not meet in Zone 3 even with mitigation due to almost continuous noise in Quartermaster area and >25% audibility in other areas. Possible to meet in Zone 2 with enough mitigation.	Does not meet in Zone 3 even with mitigation due to almost continuous noise in Quartermaster area and >25% audibility in other areas. Meets in Zone 2 with mitigation.	Does not meet in Zone 3 due to the most noise of all alternatives in Quartermaster area, and >25% audibility in other areas. Meets in Zone 2 with mitigation due to elimination of upriver boats above RM 273.

Resource / Management Objectives	Alternatives				
	1	2	3	4	5
Caves and Paleontological Resources •Manage river use to ensure compliance with cave closures and provide for protection of caves and paleontological resources from adverse effects from visitation.	Does not meet due to unregulated visitation, unlimited trip lengths, large group sizes and lack of active cave and paleontological site management. Effects cannot be reasonably mitigated.	Meets (with reasonable mitigation) the objective by regulating use, limiting trip lengths and reducing group size.	Meets (with reasonable mitigation) the objective by regulating use, limiting trip lengths and reducing group size.	Meets (with reasonable mitigation) the objective by regulating use, limiting trip lengths and reducing group size.	Meets (with reasonable mitigation) the objective by, regulating use, limiting trip lengths and reducing group size.
Vegetation •Manage river recreational activities to minimize human-caused impacts to native vegetation, reduce the spread of exotic plant species, and preserve fundamental biological and physical processes.	Does not meet because of uncontrolled use, large group sizes, and high numbers of users. Impacts could not be reasonably mitigated to minor levels.	Meets because of reduced group sizes, trip lengths, and overall use including upriver travel, which would reduce impacts to vegetation.	Meets because reducing group size, trip length, number of passengers, and regulating upriver use will reduce impacts to vegetation. Mitigation measures would be extensive and need to be employed at increased levels.	Meets but group size is still too large and the increase in overnight use will have adverse effects on vegetation. Short trip lengths will help reduce impacts. Mitigation measures would need to be extensive and need to be employed at increased levels which may not be reasonable.	Does not meet because total use and number of fuel storage areas increases significantly, while group sizes remain high. Impacts could not be reasonably mitigated to minor levels.
Terrestrial Wildlife •Manage river recreational use in a manner that protects native terrestrial wildlife and their habitats, and that preserves wildlife populations by minimizing human-caused wildlife disturbances and habitat alteration.	Does not meet due to unregulated motor boat, jet boat and helicopter use, as well as large group sizes. Impacts cannot be reasonably mitigated to minor.	Meets, but only with increased mitigation because increasing overnight trips will have some adverse effects.	Does not meet because increased overnight use along with doubling pontoon use and helicopter use will have adverse impacts on wildlife. Impacts cannot be reasonably mitigated to minor	Does not meet because of increases in total HRR use including overnight trips and day use passengers. Impacts cannot be reasonably mitigated to minor	Does not meet because of increases in total HRR use including overnight trips and day use passengers as well as significant increases in numbers of pontoon boats and helicopters. Impacts cannot be reasonably mitigated to minor
Aquatic Resources •Manage river recreational use in a manner that protects native aquatic organisms, reduces aquatic habitat alteration, and minimizes the spread of exotic species.	Does not meet because large group sizes, long trip lengths, uncontrolled motor use all create unacceptable levels of impacts that cannot be reasonably mitigated.	Meets because smaller group sizes, short trip lengths, the elimination of pontoon boats, reduction in jet boats will all reduce impacts to aquatic resources to minor levels.	Meets with extensive mitigations because of reductions in group size and trip length and the short-term nature of the mainstem impacts.	Meets with extensive mitigations because of reductions in group size, trip length and pontoon boat use.	Does not meet because increasing use to significantly higher levels increases impacts even with mitigations. Impacts cannot be reasonably mitigated to minor levels.

Resource / Management Objectives	Alternatives				
	1	2	3	4	5
Threatened or Endangered Species •Protect all threatened, endangered, sensitive, and candidate species and their habitats from impacts associated with river recreational activities.	Does not meet due to unregulated motor boat, jet boat and helicopter use, as well as large group sizes. Impacts cannot be reasonably mitigated to minor.	Meets, but only with increased mitigation because increasing overnight trips will have some adverse effects.	Does not meet because increased overnight use along with doubling pontoon use and helicopter use will have adverse impacts on threatened and endangered wildlife. Impacts cannot be reasonably mitigated to minor	Does not meet because of increases in total HRR use including overnight trips and day use passengers. Impacts cannot be reasonably mitigated to minor	Does not meet because of increases in total HRR use including overnight trips and day use passengers as well as significant increases in numbers of pontoon boats and helicopters. Impacts cannot be reasonably mitigated to minor
Cultural Resources •Maintain the integrity of all significant cultural resources, with site preservation the optimal condition. If preservation is not possible, slow the rate at which their essential material qualities are lost.	Does not meet the objective due to unregulated use, large group sizes and lack of active site management. Effects cannot be reasonably mitigated.	Meets (with reasonable mitigation) the objective by regulating use, limiting trip lengths and reducing group size which helps to maintain the integrity of significant cultural resources.	Meets (with reasonable mitigation) the objective by regulating use, limiting trip lengths and reducing group size which helps to maintain the integrity of significant cultural resources.	Meets (with reasonable mitigation) the objective by regulating use, limiting trip lengths and reducing group size which helps to maintain the integrity of significant cultural resources.	Meets (with reasonable mitigation) the objective by regulating use, limiting trip lengths and reducing group size which helps to maintain the integrity of significant cultural resources.
•Provide opportunities for present and future populations to understand, experience, and reflect the human history as evidenced through cultural resources in and near the river corridor; protect these resources from adverse effects from visitation.	Does not meet the objective due to limited interpretation and protection of sensitive resources from unregulated visitation.	Meets the objective (with reasonable mitigation) by reducing group size and length of trip and providing increased education and interpretation of sensitive cultural resources	Meets the objective (with reasonable mitigation) by reducing group size and length of trip and providing increased education and interpretation of sensitive cultural resources	Meets the objective (with reasonable mitigation) by reducing group size and length of trip and providing increased education and interpretation of sensitive cultural resources	Meets the objective (with reasonable mitigation) by reducing group size and length of trip and providing increased education and interpretation of sensitive cultural resources
•Preserve the integrity and condition of cultural resources and provide opportunities for traditional access by neighboring American Indian tribal members.	Does not meet the objective due to lack of preservation of significant resources and lack of identified opportunities for American Indian tribal members for access to traditional resources.	Meets (with reasonable mitigation) the objective by reducing the group size and congestion at significant cultural resources and sensitive traditional cultural sites.	Meets (with reasonable mitigation) the objective by reducing the group size and congestion at significant cultural resources and sensitive traditional cultural sites.	Meets (with reasonable mitigation) the objective by reducing the group size and congestion at significant cultural resources and sensitive traditional cultural sites.	Meets (with reasonable mitigation) the objective by reducing the group size and congestion at significant cultural resources and sensitive traditional cultural sites.
Visitor Experience •Provide a diverse range of quality recreational opportunities for visitors to experience and understand the environmental interrelationships, resources, and values of Grand Canyon National Park.	Meets by providing a diverse range of river trip opportunities, including shorter day and overnight trips, as well as short scenic pontoon tours.	Meets by providing a diverse range of river trip opportunities, including shorter day and overnight trips.	Meets by providing a diverse range of river trip opportunities, including shorter day and overnight trips, as well as short scenic pontoon tours.	Meets by providing a diverse range of river trip opportunities, including shorter day and overnight trips, as well as short scenic pontoon tours.	Meets by providing a diverse range of river trip opportunities including, shorter day and overnight trips, as well as short scenic pontoon tours.

Resource / Management Objectives	Alternatives				
	1	2	3	4	5
•Levels and types of use enhance visitor experience and minimize crowding, conflicts, and resource impacts.	Does not meet due to high pontoon tour and helicopter use levels in Zone 3.	Meets by reducing group size, setting daily launch limits and prohibiting pontoon tours.	Meets (with reasonable mitigations) by reducing group size, setting lower launch limits in non-peak use periods and designating HRR camps.	Meets (with reasonable mitigations) by reducing group size, setting lower launch limits in non-peak use periods designating HRR camps, and setting lower pontoon tour use levels in Zone 3.	Does not meet due to higher pontoon tour use levels in Zone 3.
•Manage the Colorado River through Grand Canyon National Park to protect and preserve the resource in a wild and primitive condition and provide a wilderness river experience.	Does not meet due to pontoon tour use and cumulative effects of helicopter tours and flights associated with pontoon tours.	Meets by prohibiting pontoon tours and reducing jet boat use.	Does not meet due to pontoon tour use and cumulative effects of helicopter tours and flights associated with pontoon tours.	Does not meet due to pontoon tour use and cumulative effects of helicopter tours and flights associated with pontoon tours.	Does not meet due to pontoon tour use and cumulative effects of helicopter tours and flights associated with pontoon tours.
Socioeconomic Environment •Provide a diverse range of recreational opportunities while minimizing the impacts of actions to resources, user groups, and park neighbors.	Meets	Meets by providing opportunity for increase in tribal income.	Meets by providing opportunity for increase in tribal income.	Meets by providing opportunity for increase in tribal income.	Meets by providing opportunity for increase in tribal income.
Park Operations •Ensure sufficient fiscal and human resources necessary to successfully implement the plan.	Does not meet due to current deficiencies in fiscal and human resources.	Meets (with reasonable mitigation) by reducing use levels and prohibiting pontoon tours.	Does not meet due to number of pontoon tours in addition to increased daily launches.	Meets (with reasonable mitigation) due to decreased pontoon tours plus increased daily launches.	Does not meet due to high pontoon tours in addition to increased daily launches.
Adjacent Lands (See Other Resource Topics for Resource Specific Objectives) •Minimize adverse effects from river management to areas outside of the park.	Meets (range of opportunity consistent with the Lake Mead Management Plan, topography minimizes trespass) Assumes greater enforcement and implementation of permit systems.	Meets (range of opportunity consistent with the Lake Mead Management Plan, topography minimizes trespass) Assumes greater enforcement and implementation of permit systems.	Meets (range of opportunity consistent with the Lake Mead Management Plan, topography minimizes trespass) Assumes greater enforcement and implementation of permit systems.	Meets (range of opportunity consistent with the Lake Mead Management Plan, topography minimizes trespass) Assumes greater enforcement and implementation of permit systems.	Meets (range of opportunity consistent with the Lake Mead Management Plan, topography minimizes trespass) Assumes greater enforcement and implementation of permit systems.
•Minimize adverse effects of adjacent land activities on park resources and river activities.	Identified impacts are beyond the scope or control of this plan.	Identified impacts are beyond the scope or control of this plan.	Identified impacts are beyond the scope or control of this plan.	Identified impacts are beyond the scope or control of this plan.	Identified impacts are beyond the scope or control of this plan.
•Work cooperatively with the Hualapai Tribe and other adjacent land managers on alternatives and implementation of a final *Colorado River Management Plan.*	Meets (range of opportunity consistent with the Lake Mead Management Plan, topography minimizes trespass) Assumes greater enforcement and implementation of permit systems.	Meets (range of opportunity consistent with the Lake Mead Management Plan, topography minimizes trespass) Assumes greater enforcement and implementation of permit systems.	Meets (range of opportunity consistent with the Lake Mead Management Plan, topography minimizes trespass) Assumes greater enforcement and implementation of permit systems.	Meets (range of opportunity consistent with the Lake Mead Management Plan, topography minimizes trespass) Assumes greater enforcement and implementation of permit systems.	Meets (range of opportunity consistent with the Lake Mead Management Plan, topography minimizes trespass) Assumes greater enforcement and implementation of permit systems.

THE ENVIRONMENTALLY PREFERRED ALTERNATIVES

The environmentally preferred alternative is defined by the Council on Environmental Quality as the alternative that best meets the following criteria or objectives, as set out in Section 101(b) of the National Environmental Policy Act (42 USC 4331):

1. fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
3. attain the widest range of beneficial uses of the environment without degradations, risk to health or safety, or other undesirable and unintended consequences;
4. preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety, of individual choice;
5. achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities;
6. enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources."

This section is based on the results of the impact analysis for each of the alternatives, as presented in "Chapter 4" and summarized in Table 2-9. The environmentally preferred alternative for the Less Ferry alternatives and the Lower Gorge alternatives is the alternative that best meets or exceeds the requirements set forth in section 101(b) of the National Environmental Policy Act.

LEES FERRY ALTERNATIVES

NEPA SECTION 101(B) COMPLIANCE

The following analysis evaluates how well the alternatives would meet the NEPA criteria:

- *Criterion 1* — As trustees of the environment for future generations, the primary threat to the resources from recreational use comes from congestion and crowding. Therefore reductions in daily launches, trips at one time, group size, and trip length would contribute to resource preservation through reductions in impacts. Significant decreases in the yearly total passengers, coupled with the above variables, would further aid in the preservation of the physical environment. The preservation of the environment would ensure that future generations would be able to enjoy it.
- *Criterion 2* — To assure safe, healthful, productive, and pleasing surroundings, the river environment should be free of many of the day-to-day urban experiences the public leaves behind when they enter into the Grand Canyon environment. Crowding is known to have a significant effect on the experience and satisfaction of river trip participants (Shelby and Whittaker 2004). Alternatives that reduce crowding through reductions in

daily launches, trips at one time, trip length, and group size would contribute to compliance with this criterion by making surroundings more aesthetically pleasing. However, these reductions must be balanced with ample opportunities to experience a culturally pleasing environment. One important consideration is the opportunity to experience the natural soundscape of the canyon without the intrusion of boat and helicopter motor noise. Alternatives with more opportunities would contribute more to the desired balance than alternatives in which there was less opportunity to take a trip that would never encounter motor noise.

- *Criterion 3* — To attain the widest range of beneficial uses of the environment without degradations, risk to health or safety, or other undesirable and unintended consequences, management of recreational use must reduce threats to resources while offering a variety of recreational opportunities. Degradation of the river environment from crowding represents one of the primary recreational use threats within the area of potential effect. Therefore, reductions in daily launches, trips at one time, trip length, and group size contribute to resource preservation through reductions in impacts. These reductions, however, must be balanced with the ability of each alternative to offer the widest range of appropriate river experiences. Alternatives would contribute to the achievement of this element of the criterion based on the degree to which they would offer a balanced variety of trip types and characteristics (motorized and non-motorized, varied group sizes, seasonal access to commercial and noncommercial trips, varied exchange options and trip lengths, and opportunities for solitude or social experience).
- *Criterion 4* — To preserve important historic, cultural, and natural aspects of our national heritage, and to maintain, wherever possible, an environment that supports diversity and variety of individual choice, recreational use management must reduce threats to these resources while offering a diverse range of recreational opportunities. Crowding represents one of the primary recreational use threats to the preservation of resources in the river corridor. Therefore reductions in daily launches, trips at one time, and group size contribute to resource preservation through reductions in impacts. These reductions, however, must be balanced with the ability of each alternative to offer the widest diversity and variety of choices for river trips. Alternatives would contribute to the achievement of this element of the criterion based on the degree to which they offered a balanced variety of trip types and characteristics (motorized and non-motorized, varied group sizes, seasonal access to commercial and noncommercial trips, varied exchange options and trip lengths, and opportunities for solitude or social experience).
- *Criterion 5* — To achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities, recreational use must be managed to offer reasonable access to a variety of recreational opportunities that range from solitary to social enjoyment of the river environment. Daily life on the river and the ability to enjoy the amenities of a river trip are known to be affected by crowding (Shelby and Whittaker 2004. Crowding also has a significant effect on the resource. Alternatives that mitigate crowding through reductions in daily launches, trips at one time, and group size contribute to achievement of this criterion. Reductions in crowding, however, must be balanced with parity in access to a wide variety of people, including both the commercial and noncommercial boating communities. While specific demand for both groups is unknown, it is assumed that in both cases it is higher than current. Alternatives that bring

parity to use levels for these groups (as measured by user-days and total passengers), while allowing at least current use, would contribute more to this element of the criterion than alternatives that reduced overall use or failed to address disparity of allocation.

- *Criterion 6* — To enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources, recreational use should be managed to limit loss and promote generation of renewable resources. Renewable resources in the area of potential effect are primarily natural resources, such as biological resources and soundscape. Crowding represents one of the primary threats to biological resources; therefore, reductions in daily launches, trips at one time, and group size contribute to the enhancement of these resources through reductions in impacts. Natural soundscape is affected primarily by motorboat and helicopter use. Thus, alternatives that have no motorized use would contribute to achieving this criterion more than alternatives that would have temporally limited motorboat and/or helicopter use.

Table 2-9 shows how each alternative would achieve the requirements of the six criteria.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

Based on the analysis in Table 2-9, Alternative H (the NPS Preferred Alternative) best achieves the requirements of the NEPA Section 101(b) criteria. This alternative meets, and sometimes exceeds, each of the six criteria.

TABLE 2-9: HOW WELL THE LEES FERRY ALTERNATIVES MEET NEPA SECTION 101(b) CRITERIA

Criterion	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Alternative G	Alternative H
1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.	**Does not meet:** Big groups, spikes in trips at one time and launches, long trips (in number of days).	**Exceeds:** Fewer trips and people, smaller groups, less crowding.	**Meets:** Fewer daily launches, smaller groups, less crowding.	**Meets**: Fewer daily launches, smaller groups, less crowding.	**Meets:** Fewer daily launches, smaller groups, less crowding.	**Meets:** Fewer daily launches, smaller groups, less crowding.	**Meets:** Fewer daily launches, smaller groups, less crowding.	**Meets:** Fewer daily launches, smaller groups, less crowding.
2. Assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings.	**Does not meet:** Crowding, large groups, spikes in number of launches. Unequal motor / no-motor seasons. Continued Whitmore helicopter exchanges year-round.	**Exceeds:** Fewer daily launches, trips and people; smaller groups; substantially less crowding. No motorized river use. No Whitmore helicopter exchanges.	**Exceeds:** Fewer daily launches, smaller groups; less crowding. No motorized river use. No Whitmore helicopter exchanges.	**Meets:** Fewer daily launches, smaller groups, less crowding. Unequal motor / no-motor seasons. No Whitmore helicopter exchanges.	**Meets:** Fewer daily launches, smaller groups, less crowding. Equal motor / no-motor seasons. Whitmore helicopter exchanges six months a year.	**Meets:** Fewer daily launches, smaller groups, less crowding. Equal motor / no-motor seasons. Whitmore helicopter exchanges six months a year.	**Does not meet:** Large groups, little opportunity for solitude. Unequal motor / no-motor seasons. Whitmore helicopter exchanges eight months a year.	**Exceeds:** Fewer daily launches, smaller groups, less crowding. Equal motor / no-motor seasons. Whitmore helicopter exchanges four months a year.
3. Attain the widest range of beneficial uses of the environment without degradations, risk to health or safety, or other undesirable and unintended consequences.	**Does not meet:** Big groups, spikes in trips at one time and launches, Long trips (in number of days), resource damage. Unequal motor / no-motor seasons. No small trips offered.	**Does not meet:** Limited trip type opportunities (compared to existing conditions).	**Does not meet:** Limited trip type opportunities (compared to existing conditions).	**Meets:** Fewer daily launches, small groups, less crowding. Variety of trip types, including winter commercial trips, but unequal motor/no-motor seasons. No Whitmore helicopter exchanges.	**Meets:** Fewer daily launches, small groups, less crowding. Short trips, variety of trip types. No winter commercial trips, but equal motor/no-motor seasons. Whitmore helicopter exchanges six months a year.	**Exceeds:** Fewer daily launches, smaller groups, less crowding. Variety of trip types, including commercial winter trips and equal motor/no-motor seasons. Whitmore helicopter exchanges six months a year.	**Does not meet:** Fewer daily launches, short trips. Variety of trip types, but no commercial winter trips and unequal motor / no-motor seasons. Whitmore helicopter exchanges eight months a year.	**Exceeds:** Fewer daily launches, smaller group sizes, various motor group sizes, less crowding. Variety of trip types, including winter commercial trips and equal motor/no-motor seasons. Whitmore helicopter exchanges four months a year.

Criterion	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Alternative G	Alternative H
4. Preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety, of individual choice.	**Meets:** Natural and cultural sites preserved (more so than if they were not in a park). Many trip choices. Continued Whitmore helicopter exchanges year-round.	**Does not meet:** Increased preservation. Decreased trip variety and exchange options.	**Does not meet:** Increased preservation Decreased trip variety and exchange options.	**Meets:** Fewer daily launches, small groups, less crowding. Variety of trip types, including winter commercial trips, but unequal motor/no-motor seasons. No Whitmore helicopter exchanges.	**Meets:** Fewer daily launches, small groups, less crowding. Variety of trip types, but no winter commercial trips; equal motor/no-motor seasons. Whitmore helicopter exchanges six months a year.	**Meets:** Fewer daily launches, smaller groups, less crowding. Variety of trip types, including commercial winter trips, and equal motor/no-motor seasons. Whitmore helicopter exchanges six months a year.	**Does not meet:** Short trips, less opportunity for solitude, big groups. No commercial winter trips, and unequal motor / no-motor seasons. Whitmore helicopter exchanges eight months a year.	**Exceeds:** Fewer daily launches, smaller group sizes, variety of commercial group sizes, less crowding. Variety of trip types, including winter commercial trips; equal motor/no-motor seasons. Whitmore helicopter exchanges four months a year.
5. Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities.	**Does not meet:** Current use represents commercial demand. Disparity between commercial and private user-day allocation (66/34). Substantial disparity between commercial / private passenger numbers (84/16) Large trips, crowding.	**Does not meet:** Does not allow for current commercial passenger numbers. Increase in private passenger numbers. Decrease in yearly total passenger numbers. Near parity between commercial / private user-day allocation (57/43). Less disparity between commercial / private passenger numbers (61/39). Smaller groups, less crowding.	**Meets:** Does not allow for current commercial passenger numbers. Increase in private passengers. Increase in yearly total passengers. Less disparity between commercial/ private user-day allocation (59/41). Less disparity between commercial / private passenger numbers (70/30) Smaller groups, less crowding)	**Does not meet:** Does not allow for current commercial passenger numbers. Increase in private passenger numbers. Decrease in yearly total passengers. Less disparity between commercial / private user-day allocation (62/38). Less disparity between commercial / private passenger numbers (73/27) Smaller groups, less crowding.	**Meets:** Does not allow for current commercial passenger numbers. Increase in private passenger numbers. Increase in yearly total passengers. Parity between commercial / private user-day allocation (49/51). Less disparity between commercial / private passenger numbers (69/32) Smaller groups, short trips, less crowding.	**Exceeds:** Allows for at least current use, with increase in private use. Near parity between commercial / private user-day allocation (55/45). Less disparity between commercial / private passenger numbers (73/27). Smaller groups, less crowding.	**Meets:** Allows for at least current use, with increase in private use. Near parity between commercial / private user-day allocation (46/54). Less disparity between commercial / private passenger numbers (69/31). Short trips, large groups not high quality, little opportunity for solitude.	**Exceeds:** Allows for at least current use, with increase in private use. Near parity between commercial / private user-day allocation (53/47). Less disparity between commercial / private passenger numbers (75/25) Smaller groups, less crowding.

Criterion	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Alternative G	Alternative H
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.	**Does not meet:** Crowding from use spikes and large group sizes damage vegetation. Soundscape impacts from nine-month motor/helicopter season.	**Exceeds:** Fewer daily launches, smaller groups. No soundscape impacts from motorized use / helicopters.	**Exceeds:** Fewer daily launches, smaller groups. No soundscape impacts from motorized use / helicopters.	**Meets:** Fewer daily launches, smaller groups. Fewer soundscape impacts from four-month no-motor use, no helicopters.	**Meets:** Fewer daily launches, smaller groups. Fewer soundscape impacts from six-month no-motor season, no helicopters.	**Meets:** Fewer trips and people, smaller groups. Fewer soundscape impacts from six-month no-motor season, no helicopters.	**Does not meet:** Large groups for an entire season. Soundscape impacts from eight-month motor season and helicopters.	**Exceeds:** Fewer trips and people, smaller groups. Fewer soundscape impacts from four-month motor season and helicopters.

NEPA SECTION 101 COMPLIANCE

The following evaluation looks at the elements that measure compliance with each of the section 101(b) criteria:

- *Criterion 1* — As trustees of the environment for future generations, the primary threat to the resources from recreational use comes from congestion and crowding. Therefore reductions primarily in group size, but also in daily launches, daily total passengers, trip length, and upstream travel would contribute to resource preservation through reductions in impacts. Coupled with the above variables, the creation of additional campsites (at low levels of development) would further aid in the preservation of the physical environment. The preservation of the environment would ensure that future generations would be able to enjoy it.
- *Criterion 2* — To assure safe, healthful, productive, and pleasing surroundings, the river environment should be free of many of the day-to-day urban experiences the public leaves behind when they enter into the Grand Canyon environment. Crowding is known to have a significant effect on the experience and satisfaction of river trip participants (Shelby and Whittaker 2004). Alternatives that reduce crowding through reductions in daily launches, group size, daily total passengers, trip length, upstream travel, and number of boats would contribute to compliance with this criterion by making surroundings more aesthetically pleasing. However, these reductions must be balanced with ample opportunities to experience a culturally pleasing environment within the context of the management zone. One important opportunity is the ability to experience periods of natural quiet in the canyon without the intrusion of boat and helicopter motor noise. All of the Lower Gorge alternatives would allow motorboats, thus for this element, the number of motor raft trips, pontoon trips (with their associated helicopter shuttles), and the number of jetboat trips allowed from Lake Mead were analyzed to determine the level and anticipated duration of noise that might detract from achieving a culturally pleasing environment.
- *Criterion 3* — To attain the widest range of beneficial uses of the environment without degradations, risk to health or safety, or other undesirable and unintended consequences, recreational use management must reduce threats to resources while offering a variety of recreational opportunities. Degradation of the river environment from crowding represents one of the primary recreational use threats within the area of potential effect. Reductions primarily in group size, but also in daily launches, daily total passengers, trip length, upstream travel, and number of boats would contribute to compliance with this criterion by mitigating impacts to resources from visitation. These reductions would also mitigate safety hazards, a consideration in higher use alternatives where there would be a substantial increase in river use and, consequently, air traffic. These reductions, however, must be balanced with the ability of each alternative to offer the widest range of appropriate river experiences. Alternatives would contribute to the achievement of this element of the criterion based on the degree to which they offered a balanced variety of trip types (day and overnight raft trips, pontoon trips, and upriver trips from Lake Mead) and

characteristics (group sizes, trip lengths, varied exchange options, and opportunities for solitude or social experience).

- *Criterion 4* — To preserve important historic, cultural, and natural aspects of our national heritage, and to maintain wherever possible an environment that supports diversity and variety of individual choice, recreational use management must reduce threats to these resources while offering a diverse range of recreational opportunities. Crowding represents one of the primary recreational use threats to the preservation of resources of national significance in the Lower Gorge. Reductions primarily in group size, but also in daily launches, daily total passengers, trip length, upstream travel, and number of boats contribute to compliance with this criterion by mitigating impacts to resources from visitation. These reductions, however, must be balanced with the ability of each alternative to offer the widest diversity and variety of choices for river trips. Alternatives would contribute to the achievement of this element of the criterion based on the degree to which they offered a balanced variety of trip types(day and overnight raft trips, pontoon trips, and upriver trips from Lake Mead) and characteristics (group sizes, trip lengths, varied exchange options, and opportunities for solitude or social experience).
- *Criterion 5* — To achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities, recreational use must be managed to offer reasonable access to a variety of recreational opportunities that range from solitary to social enjoyment of the river environment. Daily life on the river and the ability to enjoy the amenities of a river trip are affected by crowding, even in management zones that are less than primitive. Crowding also has a significant effect on the resource. Alternatives that mitigate crowding through reductions in daily launches, group size, daily total passengers, upstream travel, and number of boats would contribute to compliance with this criterion. Reductions in crowding, however, must be balanced with meeting the current demand for river trips in the Lower Gorge. Alternatives that would allow for current types of use, while allowing at least current use, would contribute more to this element of the criterion than alternatives that decreased trip types and use levels for each trip type.
- *Criterion 6* — To enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources, recreational use should be managed to limit loss and promote the generation of renewable resources. Renewable resources in the area of potential effect are limited primarily to natural resources such as vegetation, biological resources, soundscape, and air quality. Crowding represents one of the primary threats to vegetation and biological resources; therefore, reductions in group size, daily launches, daily total passengers, upstream travel, and number of boats would contribute to the enhancement of these resources through reductions in impacts. Soundscape, or natural quiet, and air quality are affected primarily by pontoon boats, jetboats and helicopter use. Thus, reductions in pontoon, jetboat, and helicopter use would contribute to compliance with this aspect of this criterion.

An analysis of how each alternative would achieve the requirements of these six criteria is detailed in Table 2-10.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

Based on the analysis in Table 2-10, Alternative 4 (the NPS Preferred Alternative) would best achieve the requirements of the NEPA Section 101(b) criteria. This alternative meets, and sometimes exceeds, each of the six criteria.

TABLE 2-10: HOW WELL THE LOWER GORGE ALTERNATIVES MEET NEPA SECTION 101(b) CRITERIA

Criterion	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations	**Does not meet:** Very large groups; unrestricted group sizes and daily passengers. Unrestricted upstream travel. Limited camps. Deteriorating facilities	**Exceeds:** Much smaller groups, far fewer daily passengers from Diamond Creek. No pontoon use or helicopter support. Limited upstream travel (two jetboats). Additional camps. No facilities.	**Meets:** Near current levels of Diamond Creek passengers per day, but much smaller group sizes. Above current average of pontoon use, with associated helicopter support. Fewer jetboats. Two additional camps. Improved small dock.	**Meets:** Smaller groups, but increase in Diamond Creek passengers per day. Somewhat below current average daily pontoon passengers and associated helicopter support. Limited upstream travel (four jetboats). Three additional undeveloped camps. Improved small dock.	**Does not meet:** Smaller groups, but increase in Diamond Creek passengers per day. Substantial increase in pontoon use and associated helicopter support. No jetboat use. Three additional developed camps. Improved large dock.
2. Assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings	**Does not meet:** Very large groups; unrestricted group sizes and daily passengers. Spikes in pontoon use and associated helicopter support. Unrestricted upstream travel. Limited camps. Deteriorating facilities	**Exceeds:** Much smaller groups, far fewer daily passengers from Diamond Creek. No pontoon use or associated facilities / helicopter support. Limited upstream travel (two jetboats). Additional camps.	**Does not meet:** Near current levels of Diamond Creek passengers per day, but much smaller group size. Above current average of pontoon use, with associated helicopter support. Fewer jetboats. Two additional camps. Improved small dock.	**Meets:** Smaller groups, but increase in Diamond Creek passengers per day. Somewhat below current average daily pontoon passengers and associated helicopter support. Limited upstream travel (four jetboats). Three additional undeveloped camps. Improved small dock.	**Does not meet:** Smaller groups, but increase in Diamond Creek passengers per day. Substantial increase in pontoon use and associated helicopter support. No jetboat use. Three additional developed camps. Improved large dock.
3. Attain the widest range of beneficial uses of the environment without degradations, risk to health or safety, or other undesirable and unintended consequences	**Does not meet:** Variety of trip types, but very large groups, unrestricted group sizes and daily passengers Spikes in pontoon use and associated helicopter support. Unrestricted upstream travel. Deteriorating facilities	**Does not meet:** Reduced resource impacts, but pontoon and helicopter trips eliminated.	**Meets:** Near current use levels for HRR day trips, and above average use for HRR overnight and pontoon trips, but reduced group sizes. Use spikes eliminated. Dock facilities improved.	**Exceeds:** Smaller groups, but increase in Diamond Creek passengers per day. All trip types offered, with addition of kayak shuttles. Caps on HRR and pontoon passengers. Limited upstream travel. Improved docking facility.	**Does not meet:** Smaller groups, but increase in Diamond Creek passengers per day. Substantial increase in pontoon use and associated helicopter support. No jetboat use. Improved large dock.

Criterion	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
4. Preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety, of individual choice	**Meets:** Natural and cultural sites preserved (more so than if they were not in a park). Lots of trip choices.	**Does not meet:** Reduced resource impacts, but pontoon and helicopter trips eliminated.	**Meets:** Near current use levels for HRR day trips and above average use for HRR overnight and pontoon trips, but reduced group sizes and use spikes eliminated.	**Exceeds:** Increase over current average for HRR day and overnight use, but below average pontoon use. Smaller group sizes, and use spikes eliminated.	**Meets:** Smaller groups, but increased Diamond Creek passengers per day. Substantial increase in pontoon use and associated helicopter support. No jetboat use.
5. Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities	**Does not meet:** Unregulated spikes in use affect resources and visitor experience. Use represents current demand.	**Does not meet:** Reduced resource impacts, but pontoon and helicopter trips eliminated, decreased HRR day trip passengers, increased overnight passengers.	**Exceeds:** Near current average for HRR use and above current average for pontoon use while spikes eliminated and group sizes reduced. Increased HRR overnight passengers.	**Meets:** Increase over current average for HRR day and overnight use, but below average pontoon use while use spikes eliminated and group sizes reduced.	**Does not meet:** While use levels increased over current average HRR day and overnight use, and substantially above average pontoon use. Use allowed to increase above current demand for all trip types, but visitor experience degraded by crowding and continuous noise from pontoons and helicopters.
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources	**Does not meet:** Very large groups, unrestricted group sizes, daily passengers, and upstream travel. Spikes in HRR and pontoon use and associated helicopter support. Limited camps.	**Exceeds:** Much smaller groups, far fewer daily passengers from Diamond Creek, limited upstream travel (two jetboats). No pontoon use or associated facilities or helicopter support. Additional camps.	**Does not meet:** Near current levels of Diamond Creek passengers per day, but much smaller group sizes. Above current average of pontoon use, with associated helicopter support. Fewer jetboats. Two additional camps.	**Meets:** Smaller groups, but increase in Diamond Creek passengers per day, limited upstream travel (four jetboats). Somewhat below current average of daily pontoon passengers and associated helicopter support. Three additional undeveloped camps.	**Does not meet:** Smaller groups, but increase in Diamond Creek passengers per day. Substantial increase in pontoon use and associated helicopter support. No jetboats. Three additional undeveloped camps.

ALTERNATIVES AND OPTIONS CONSIDERED BUT ELIMINATED FROM FURTHER STUDY

Several alternatives considered in the development of this *Draft Environmental Impact Statement* were eliminated from additional study. This section describes those alternatives and the basis for not analyzing them further.

ALTERNATIVES ELIMINATED BECAUSE OF UPPER BOUND CONCERNS

In the early stages of developing alternatives, the National Park Service ran river trip simulation models for 36 distinct launch patterns. Simulator models examined two, four, six, and eight launches per day, with different combinations of commercial motor, commercial oar, and noncommercial trips. One goal was to show relationships between use patterns and key indicators (trips at one time, river encounters, and densities at attraction sites); a second goal was to establish the upper bounds of possible launch patterns.

Preliminary analysis helped establish upper bounds for non-summer use. An NPS goal was to ensure that lower density opportunities were provided in spring and fall than in summer, with the lowest density in winter. Accordingly, alternatives with more than four mixed-use launches in spring and fall or more than two in winter were eliminated.

ALTERNATIVES ELIMINATED BECAUSE OF REDUNDANCY

The development of alternatives involved decisions about use levels, types of trips, group sizes, trip length, commercial and noncommercial use, and whether motorized boats or helicopter shuttles would be allowed. Use patterns also vary by month. With so many variables, it is possible to develop many combinations. To standardize options and improve comparability for later analysis, a monthly seasonal use structure was used for all the alternatives — two months in spring, four in summer, two in fall, and four in winter. When the National Park Service did a preliminary analysis of 36 launch patterns (including those that were offered during public scoping), several were found to be very similar in spirit. To arrive at a workable number of alternatives, alternatives with similar characteristics were consolidated, while still trying to retain the intent of each.

ALTERNATIVES ELIMINATED BECAUSE OF CUMULATIVE ANNUAL USE OR OTHER CONCERNS

Several alternatives were identified that solved issues related to allocation and scoping comments encouraging increased access, but the level of projected annual use approached a threefold increase from current conditions. Research on visitor experience and impacts to cultural and natural resources indicated that such a high level of use was unacceptable.

The Lower Gorge alternatives were similarly developed, analyzed, and refined, in consultation with the Hualapai Tribe. Higher helicopter shuttle use at Whitmore was eliminated from further consideration due to impacts occurring from current use and problems of increased Lower Gorge activity (e.g., increased numbers of jetboats to take out additional "Whitmore down" passengers). Mule-based exchanges at Whitmore were eliminated from further consideration because of concerns about biophysical or cultural impacts. Higher levels of hike-out exchanges were also eliminated, assuming that interest would not exceed the number currently occurring (with no limits) at Phantom Ranch (a longer and more difficult hike, but at a location more advantageous for exchanges). The transportation and facility needs associated with higher levels of hikers would be inconsistent with management goals and actions for the adjacent Grand Canyon-Parashant National Monument.

SUPPLEMENTAL PERMIT DISTRIBUTION OPTIONS

Currently there is no supplemental permit distribution option. The planning team considered several options, including releasing 1 launch per day through a common pool lottery, releasing 10 launches per summer season through price-based auctions, implementing both options, and variations of these options. It was concluded that all the options would unnecessarily add complexity and an additional layer of bureaucratic burden to the overall permit system, with little benefit. Therefore, adding a supplementary permit distribution system to the alternatives was considered but eliminated from further study.

ELEMENTS INDEPENDENT OF THE ALTERNATIVES

NONCOMMERCIAL PERMIT SYSTEM OPTIONS

The following description of permit system options is subdivided into three main sections: initial distribution of permits, supplemental permit distributions, and transition options.

ELEMENTS COMMON TO ALL PERMIT SYSTEM OPTIONS

All noncommercial group members who signed up at the same time as the original trip leader would automatically be qualified as alternate trip leaders. This way if the original trip leader must drop out, the rest of the group could continue with their plans.

Unless a common pool system was chosen, permits for commercial companies would be issued through a separate system.

Permits for the Diamond Creek to Lake Mead section of the river would continue to be distributed on a first-come, first-served basis, and applications would be accepted no earlier than one year in advance. If demand for Diamond Creek to Lake Mead permits rose to the point that competition for permits was obviously intense, the National Park Service would reserve the right to implement the same kind of a permit system for the lower section of the river as for the upper (depending on the system chosen through this planning process). Recreational passengers would be allowed to run the Diamond Creek to Lake Mead section of the river as frequently as they desired, as long as they were able to obtain permits. Permits from the Navajo Nation, the Havasupai Tribe, or the Hualapai Tribe would be required to access all respective tribes tribal lands.

PRIMARY SYSTEM FOR DISTRIBUTION OF RIVER PERMITS

Under any permit system, trips are sometimes canceled by the participants. If the primary distribution system is well-designed, cancellations should be minimal because groups apply for time periods when they can reasonably expect to take the trip and they have enough time to prepare for it. While cancellations might occur because of illness or similar unforeseen problems for key participants, allowing alternate trip leaders and some trip participant changes should dramatically reduce the percentage of cancellations that occurs now.

Nevertheless, a secondary distribution system is still needed to distribute canceled permits. The River Permits Office will carefully consider public feedback from this planning effort in developing a secondary permit system to re-issue canceled permits.

Objectives for selecting permit distribution options include:

- Offer opportunities for new users to succeed in gaining a permit.
- Favor requests from those who have been unsuccessful in previous years.

- Minimize the bureaucratic burden for applicants.
- Preserve the group character of noncommercial trips (those who want to travel together in a group).

Administrative rules and penalties would be established to help prevent individuals from exploiting the system by adding "fake" names to the permit system.

Description of Permit Distribution Options

Waitlist for Trip Leaders (Current Permit System)

Each year those who have waited the longest on the current waitlist are contacted and offered a chance to schedule launch dates. Permits for noncommercial trips are initially distributed through a waitlist / scheduling system for trip leaders (not trip members); if trips are canceled, secondary distributions are available to those on the waiting list. Due to the length of the list (about 8,000 names), it can be 10 to 20 or more years before a person can lead a noncommercial river trip through the Grand Canyon.

Each year within a specific time window waitlist members are expected to verify their "continuing interest" in remaining on the list. Those who fail to meet this requirement twice in any four-year timeframe are removed from the list.

To remain on the list, waitlist members may participate in no more than one other Lees Ferry to Diamond Creek noncommercial trip.

Waitlist for Groups

Under this option a waitlist would be maintained for groups, where all members of each group would be listed along with the trip leader. Nobody could be listed more than once. Each year those groups who have waited the longest on the current waitlist would be contacted and offered a chance to schedule launch dates.

Each year within a specific time window waitlist groups would be expected to verify their "continuing interest" in remaining on the list. Those who failed to meet this requirement twice in any four-year period would be removed from the list.

Pure Lottery for Groups

By the lottery drawing date, all those who had expressed an interest in that particular launch date would be given equal chances at being awarded the requested launch date.

Monthly lotteries would be held one year in advance on the first of the month, and applicants could compete in only one month's lottery each year.

Weighted Lottery for Groups

Each launch opportunity would be awarded to a member of the pool of people who had registered their interest in a particular launch date by the drawing deadline. Each applicant would be given one additional chance for each year they had continuously competed in the lottery but had not been successful. Thus, someone applying for a May launch date who had applied in the lottery for a launch every year for the last five years would be given six chances.

It would be a weighted lottery for groups because all trip members listed on the original application before the drawing date would receive a fee discount and would be eligible to be alternate trip leaders should the main applicant not be able to continue the trip as planned. For the lottery drawing, trip members could be listed on only one application. Additional participants could be added later for higher fees but would not be eligible to be alternate trip leaders.

Monthly weighted lotteries would be held one year in advance on the first of the month, and applicants could compete in only one month's lottery per year.

Point-Based Auction for Groups

People would earn "wait points" for the length of time they were registered, and the points would become a "currency" that would be used to "bid" for permits in monthly auctions. Groups with more people and more time on the list would therefore have more points than smaller groups with less time on the waitlist.

Waiting points would be earned by individuals for each year on the registration list, but applications for permits would be made by groups (a roster of trip participants could not exceed group size limits). Members of a group would pool their collective waiting points to compete for a permit. Bidding would take place each month for all dates in the same month one year later. The group with the highest collective number of waiting points at the close of the bidding period would be awarded the permit.

NPS Preferred Option for Permit System

The NPS preferred option for the permit system is the weighted lottery for groups. This option offers the advantage of favoring people who had been unsuccessful in obtaining a permit in previous years while offering new users a chance as well. Table 2-11 shows how well the options would achieve objectives for the project.

TRANSITION OPTIONS

Options

New Permit System Augments Frozen Waitlist System (Existing Conditions)

The current waitlist is frozen, and waitlist members would continue to be allocated 240 launches per year at roughly the same launch pattern as today until waitlist is exhausted. All other

TABLE 2-11: HOW WELL INITIAL PERMIT DISTRIBUTION OPTIONS WOULD ACHIEVE PROJECT OBJECTIVES

	Does Option Meet Objective?				
Objective	Waitlist for Trip Leaders	Waitlist for Groups	Pure Lottery for Groups	Weighted Lottery for Groups	Point-Based Auctions for Groups
Provide opportunities for new users to succeed in gaining a permit	No	No	Yes	Yes	No
Favor those who have been continually unsuccessful in getting on a trip.	Yes	Yes	No	Yes	Yes
Minimize bureaucratic burden for applicants.	No	No	Yes	Yes	No
Retain characteristic of private trip (those who want to go together).	Yes	Yes	Yes	Yes	Somewhat

launches would be awarded through the new system selected for the initial distribution of permits. People would not be permitted to participate in both permit systems.

Encourage People to Leave Current Waitlist and Reduce the Waitlist Allocation

The current waitlist would still be frozen, and existing waitlist members could either (1) remain on the waitlist and accept rule changes, or (2) accept payment in the form of an incentive in exchange for voluntarily giving up their place on the waitlist.

The rule changes for waitlist members would include all of the following:

- Waitlist members would have to list everyone else from their group at this time. Before anyone of these could apply through the new permit system, they would be required to give up their place on the waitlist member's trip. Further additions to trips would not be allowed.
- As waitlist members moved off the list (through incentives, etc.), that proportion of permits would no longer be available to waitlist participants. For instance, if 40% of the people on the existing waitlist took incentives and left the waitlist, then 40% of the existing allocation would be transferred to the new permit system.
- Waitlist members would be allowed to band together as new single entries on the list and would be moved forward to the equivalent spot of their combined wait (e.g., if Fred had been on the list for five years and Mary for nine years, their combined wait would be 14 years, so they would receive one number and be ahead of all those who had waited 13 years or less). In addition, each person who gave up their waitlist number to "band together" with others from the waitlist would be exempted from being charged their portion of the permit fee.

To encourage waitlist members to be removed from the current waitlist, any or all of the following would be offered (pending a legal review):

- Receive $200 in transferable "backcountry credit" for use anytime within the next five years. This "backcountry credit" could be used toward river or backcountry use permits at Grand Canyon.
- Accept a refund of $150. (This would be at least as much as anyone paid to join and/or renew their place on the existing waitlist.)
- Accept $150 in transferable "backcountry credit" for use anytime within the next five years plus a free, single, weighted chance in the new permit system.
- Accept a refund of $75 plus one free weighted chance in the new permit system.
- Accept one free weighted chance in the new permit system lottery for each year an applicant has been on the waitlist. In the weighted lottery each waitlisted person who accepted this offer would start with extra chances based on number of years they were on the current list; if unsuccessful, in subsequent years they would get additional chances as long as they kept applying for the same month in each subsequent year.

Same as Now but Abandon Waitlist in Five Years

With one exception this option would be the same as the previous option except the existing waitlist would expire in five years from the implementation date, at which time those who had not accepted any incentives and remained on the list would be given full refunds of what they paid to be waitlisted.

NPS Preferred Option

The NPS preferred option for the transition system would be to encourage people to leave the current waitlist and reduce the waitlist allocation. This option would preserve flexibility and choice for people on the current waitlist while encouraging an expedited transition to the new permit system. Table 2-12 illustrates how well each of the options would achieve project objectives.

TABLE 2-12: HOW WELL THE TRANSITION SYSTEM WOULD ACHIEVE PROJECT OBJECTIVES

	Does Option Meet Objective?		
Objective	New Permit System Augments Frozen Waitlist System	Encourage People to Leave Waitlist, and Reduce Waitlist Allocation	Encourage People to Leave Waitlist, Reduce Waitlist Allocation, and Abandon List in 5 Years.
Offer opportunities for new users to succeed in gaining a permit.	No/Yes	Somewhat	Yes
Minimize bureaucratic burden for applicants.	Yes	Yes	No
Acknowledge some level of responsibility to those on current waitlist.	Yes	Yes	Yes

INITIATIVES RELATED TO CULTURALLY AFFILIATED AMERICAN INDIAN TRIBES

Regardless of the alternatives selected, the National Park Service is considering implementing one or more of the following initiatives related to culturally affiliated American Indian tribes and enhanced interpretation of the Grand Canyon from a Native American perspective, pending public review and comment:

1. The National Park Service will offer a new full-river concession contract, carved out of the current commercial allocation, to be awarded competitively under existing authorities, including, if appropriate, 36 CFR 51.17(b)(2). The new contract will comprise approximately 2,500 user-days (six launches) during the spring and summer months. The new concession contract will include, among other things, a requirement to provide interpretation of the Grand Canyon from the perspective of American Indian tribes or groups that have historical ties to the canyon and are culturally affiliated with it.
2. The National Park Service will recommend to the Department of the Interior that it support the Hualapai Tribe's efforts to obtain special legislation authorizing a noncompetitive full-river concession contract for the tribe or a tribally owned enterprise, if the tribe's legislative proposal is consistent with the management objectives of the Lees Ferry and Lower Gorge alternatives selected as the final management plan and the record of decision for this environmental impact statement.
3. At the request of a federally recognized American Indian tribe that has historical ties to the canyon and is culturally affiliated with it, the National Park Service will assist the tribe in gaining the expertise and skills necessary to compete for procurement contracts to provide services and logistical support for administrative trips, including research trips.